The
APRIL 1942
TOOL ENGINEER
MACHINERY • PRODUCTION • TOOLS

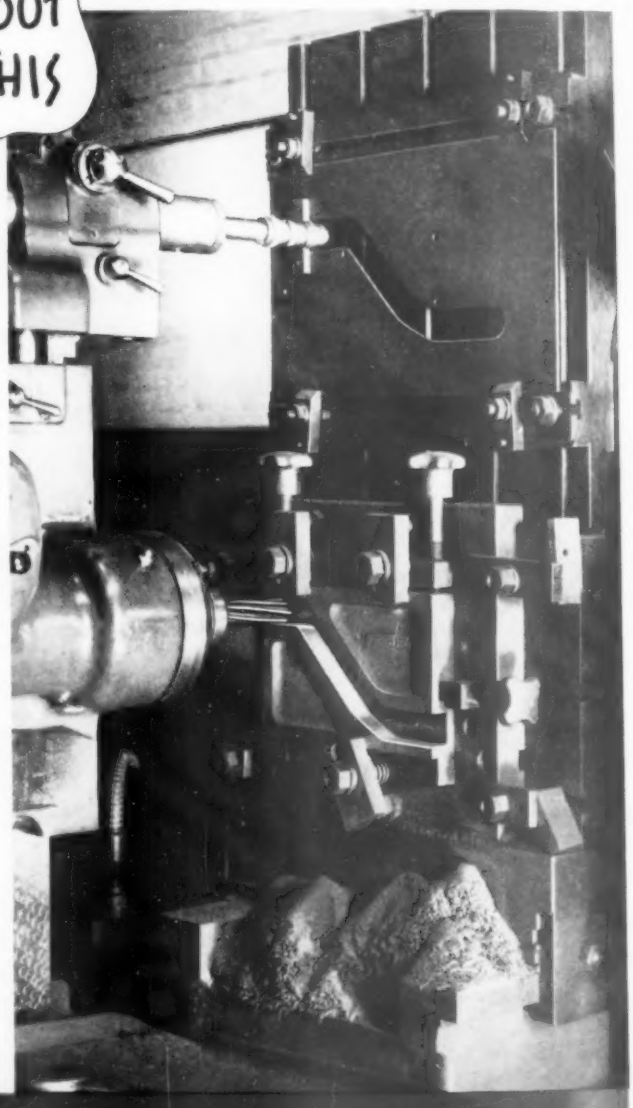
Official Publication of the American Society of Tool Engineers

This job called for 40 right hand and 40 left hand indexing cam paths for defense machine tools . . . needed in a hurry. The same simple sheet metal template is used for both by merely turning it over. The ⅞" cutter takes one roughing cut down the middle, and then a finishing cut on each side. The slot is 1⅛" wide (tolerance minus zero, plus .002") 1.103¼" long, ¾" deep . . . completed in 45 minutes each, floor to floor.

80

Needed-rush

so "Shorty" cut them on the Keller Machine



Typical of Keller Machine versatility, this job is only one of thousands. Shorty needed but a brief time to lay out and cut the template. Then the job went into production right away. No complicated tooling that eats up time and money . . . no trouble over the accuracy involved . . . the job came off the machine "okay" ready for use.

Every Keller Machine is serving our defense needs promptly and efficiently. And at some future day those same machines will go to work on peace time projects with equal ease.

Your Keller equipment will stand up under 24-hour schedules, so load on the work. If our experience can help you increase production, our men are eager to help. Ask a P&W Sales Engineer to show you how to get more out of your Keller Machine.

Pratt & Whitney, Division Niles-Bement-Pond Company, West Hartford, Conn.

PRATT&WHITNEY

ROY T. BRAMSON, *Editor and Publisher*
ALBERT C. COCHRANE, *Associate Editor*
JEROME S. WILFORD, *Associate Editor*
ANDREW E. RYLANDER, *Technical Editor*
R. G. BRAMSON, *Business Manager*
B. C. YOHE, *Circulation Manager*

THE TOOL ENGINEER

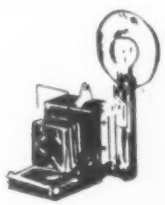
Volume XI APRIL, 1942 Number 4

Articles

Editorial

Features

News



Working to the latest deadline which TOOL ENGINEER hopes to experience for some time to come, the staff is nonetheless pleased to present Camera Highlights of the St. Louis Convention in this month's issue. And we're pretty proud of Al Cochrane who did the job on the firing line. Al sent the undeveloped film packs to Detroit each night of the convention, the gang behind the lines pushed the studio for fast printing service, and rushed finished photos to the engraver—meanwhile making up the pages. By the time Al got home, tired but happy (he's always smiling and you can't turn him down when he wants to poke his camera at you), the whole thing was on the way to the printer who had held open just one form for the rush job. Turn to pages 66 and 67.

Member
CCA
Controlled Circulation Audit, Inc.
NBP ASSOCIATION
National Business Papers Assn.

Indexed Annually in the December Issue.

Published the first Thursday of each month, by The Bramson Publishing Company. Advertising, Editorial and General offices at 2842 West Grand Boulevard, Detroit, Michigan. Telephone MAdison 4077. THE TOOL ENGINEER is the official publication of the American Society of Tool Engineers. Acceptance under the Act of June 5, 1934, at St. Joseph, Michigan, authorized December 18, 1940. Printed in the U. S. of A.

THE BRAMSON PUBLISHING COMPANY, 2842 WEST GRAND BOULEVARD, DETROIT, MICHIGAN

AMERICAN SOCIETY OF TOOL ENGINEERS

FRANK W. CURTIS, *President*

O. W. WINTER, 1st Vice-President — CLYDE L. HAUSE, Secretary
RAY H. MORRIS, 2nd Vice-President — F. R. CRONE, Treasurer

BOARD OF DIRECTORS—1941-42

Eugene Bouton	J. E. Gilchrist	C. E. Lucas
C. V. Briner	C. O. Hersam	S. R. Mack
P. W. Brown	I. F. Holland	E. H. Nieman
F. R. Crone	E. V. Johnson	W. B. Peirce
F. W. Curtis	D. C. Jones	Glen Roberts
A. H. d'Arcambal	G. J. Keller	C. G. Ross
E. W. Dickett	C. J. Lindegren	E. A. Rutzen
F. J. Diehl	N. H. Lou	C. O. Thomas
D. T. Fister		

NATIONAL COMMITTEE CHAIRMEN

Industrial Relations—E. A. Rutzen
New Chapters—R. T. Bramson
Membership—E. W. Dickett
Standards—E. W. Ernest
Editorial—I. F. Holland
Publicity—C. B. Cole
Historian—O. B. Jones
Constitution and By-Laws—R. M. Lippard
Educational—H. D. Hall
Emergency Defense Training—O. W. Winter

CHAPTER CHAIRMEN AND SECRETARIES—1942-43

(Akron) Rubber City: Edwin S. Woodhall, Chairman; George A. Irwin, Secretary, 243 Malacca Ave., Akron, Ohio.

Baltimore: Godfrey F. Steiner, Chairman; Stewart McCaughey, Secretary, 908 Belvedere Ave., Baltimore, Md.

Binghamton: Warren E. Kishbaugh, Chairman; Stanley K. Bishop, Secretary, 23 Howard Ave., Binghamton, N. Y.

Boston: John W. Geddes, Chairman; Ernest E. Vansaw, Secretary, 99 Hamilton Ave., No. Quincy, Mass.

Buffalo: William J. Gamble, Chairman; F. S. McCoy, Secretary, 76 Pearl St., Buffalo, N. Y.

Chicago: Roy R. Hoefer, Chairman; Fred J. Schmitt, Secretary, c/o D. A. Stuart Oil Co., 2727 S. Troy St., Chicago, Ill.

Cincinnati: Arthur Pletz, Chairman; Howard Voltz, Secretary, 7450 Bernard St., Cincinnati, O.

Cleveland: C. W. Scheithing, Chairman; R. H. Alexander, Secretary, 2010 E. 71st St., Cleveland, O.

Columbus: William A. Flumerfelt, Chairman; Chas. Wm. Warner, Secretary, 291 Marconi Blvd., Columbus, Ohio.

(Dallas) North Texas: Emil Shetlin, Chairman; Claude N. Wilson, Jr., Secretary, 227 N. Lancaster, Dallas, Texas.

Dayton: Howard C. McMillen, Chairman; Frank Steinbrunner, Secretary, 38 S. Horton St., Dayton, Ohio.

Detroit: Clyde Mooney, Chairman; E. C. Herman, Secretary, 14277 Hampshire, Detroit, Mich.

Elmira: M. Hugh Evans, Chairman; George Morceau, Secretary, 504 Hart, Elmira, N. Y.

Fond du Lac: K. F. Gallimore, Chairman; Henry S. Faith, Secretary, 60 S. Marr St., Fond du Lac, Wis.

(Grand Rapids) Western Michigan: E. J. Roossien, Chairman; Charles H. Antrim, Secretary, 1555 Taylor St. N.W., Grand Rapids, Mich.

Hamilton: Charles A. Fisher, Chairman; Edward L. Greer, Secretary, 7 Hughson St., S. Hamilton, Ontario.

Hartford: Harry J. Hauck, Chairman; Clayton S. Parsons, Secretary, c/o J. K. Smit & Sons, Inc., 7 South Main St., West Hartford, Conn.

Houston: H. E. Collins, Chairman; C. A. Welsh, Secretary, 1125 Wyatt St., Houston, Texas.

Indianapolis: Ronald W. Updike, Chairman; A. F. Pittman, Secretary, 245 W. 38th St., Indianapolis, Ind.

Los Angeles: C. G. Almquist, Chairman, Arthur Sonneville, Secretary, 321 Eucalyptus St., Bellflower, Calif.

Milwaukee: Julius Riedl, Chairman; Paul O. Wernicke, Secretary, 2263 N. 61st St., Wauwatosa, Wis.

(Minneapolis-St. Paul) Twin Cities: Francis E. Gruber, Chairman; Lyle E. Overholt, Secretary, 2709 Emerson Ave., Minneapolis, Minn.

(Moline) Tri-Cities: Sigurd Lunde, Chairman; L. J. Rodgers, Secretary, c/o Deere & Mansur Works, Moline, Illinois.

Montreal: John Hall, Chairman; Herbert E. Gibson, Secretary, 3800 Cote St. Catherine St., Montreal, P. Q., Can.

Nashville: H. T. Sprott, Chairman; Galen E. Meckfessel, Secretary, R.R. No. 1, Stinston Rd., Nashville, Tenn.

(New Haven) Southern Connecticut: Harry J. Bellemore, Chairman; A. H. Hitchcock, Secretary, c/o High Standards Mfg. Co., New Haven, Conn.

(New York) Greater: John J. Hogan, Chairman; Jack Schiller, Secretary, 1440 E. 14th St., Brooklyn, N. Y.

(New York-New Jersey) Northern New Jersey: Stanley A. Gruchacz, Chairman; H. Wilson Ryno, Secretary, 1060 Broad St., Newark, N. J.

Peoria: Carl A. Holmer, Chairman; John A. Ritschel, Secretary, 315 Barker Ave., Peoria, Ill.

Philadelphia: Charles Crook, Jr., Chairman; Foster M. Crayton, Secretary, 6844 Upland St., Philadelphia, Pa.

Pittsburgh: William Own, Chairman; Gus L. Kronfeld, Secretary, 1609 Investment Bldg., Pittsburgh, Pa.

Portland, Maine: Edwin R. Andrews, Chairman; Chas. E. Paige, Secretary, 99 Main Ave., Portland, Maine.

(Providence) Little Rhody: Edward J. Berry, Chairman; Earl R. Phinney, Secretary, Design Engineer, Taft-Peirce Mfg. Co., Woonsocket, Rhode Island.

Racine: A. A. Carlson, Chairman; Charles Gorton, Secretary, c/o Geo. Gorton Machine Co., Racine, Wis.

Rochester: Clifford M. Sears, Chairman; Milton L. Roessel, Secretary, 97 Biltmore Drive, Rochester, N. Y.

Rockford: F. J. Kampmeier, Chairman; Ernst A. Norrman, Secretary, 1213 Revell Ave., Rockford, Ill.

San Diego: J. J. Tucker, Chairman; R. J. Oertel, Secretary, 646 B Ave., Coronado, Calif.

(San Francisco) Golden Gate: Walter Kassebohm, Chairman; Louis A. Talamini, Secretary, 2518 64th Ave., Oakland, Calif.

Schenectady: H. Crump, Chairman; N. Y. Coxe, Secretary, General Electric Co., Bldg. No. 41, Room 235, Planning & Wage Rate Dept., Schenectady, N. Y.

Seattle: Walter Ainsworth, Chairman; Dick Melton, Secretary, 9218—35th S.W., Seattle, Wash.

South Bend: Stanley R. Cope, Chairman; Robert J. Huckins, Secretary, 1720 Mishawaka Ave., South Bend, Ind.

Springfield, Mass.: Edward C. Sheldon, Chairman; Arthur H. MacBriar, Secretary, P. O. Box 233, Forest Park Station, Springfield, Mass.

(Springfield, Vt.) Twin States: R. S. Gillette, Chairman; M. H. Jennings, Secretary, Box 316, Charlestown, N. H.

St. Louis: Clarence L. Miller, Chairman; Walter Powell, Secretary, 4557 Le Duc St., St. Louis, Mo.

Syracuse: Clayton L. Ainsley, Chairman; Raymond D. Coseo, Secretary, 239 Maplehurst Ave., Syracuse, N. Y.

Toledo: Walter Ulrich, Chairman; R. M. Hindman, Secretary, 3443 Goddard Road, Toledo, Ohio.

Toronto: E. N. Wearn, Chairman; L. G. Singer, Secretary, 11 Front St., E., Toronto, Ontario.

(Washington, D. C.) Potomac: Raymond C. Harbst, Chairman; William O. Kelch, Secretary, P. O. Box 211, Alexandria, Va.

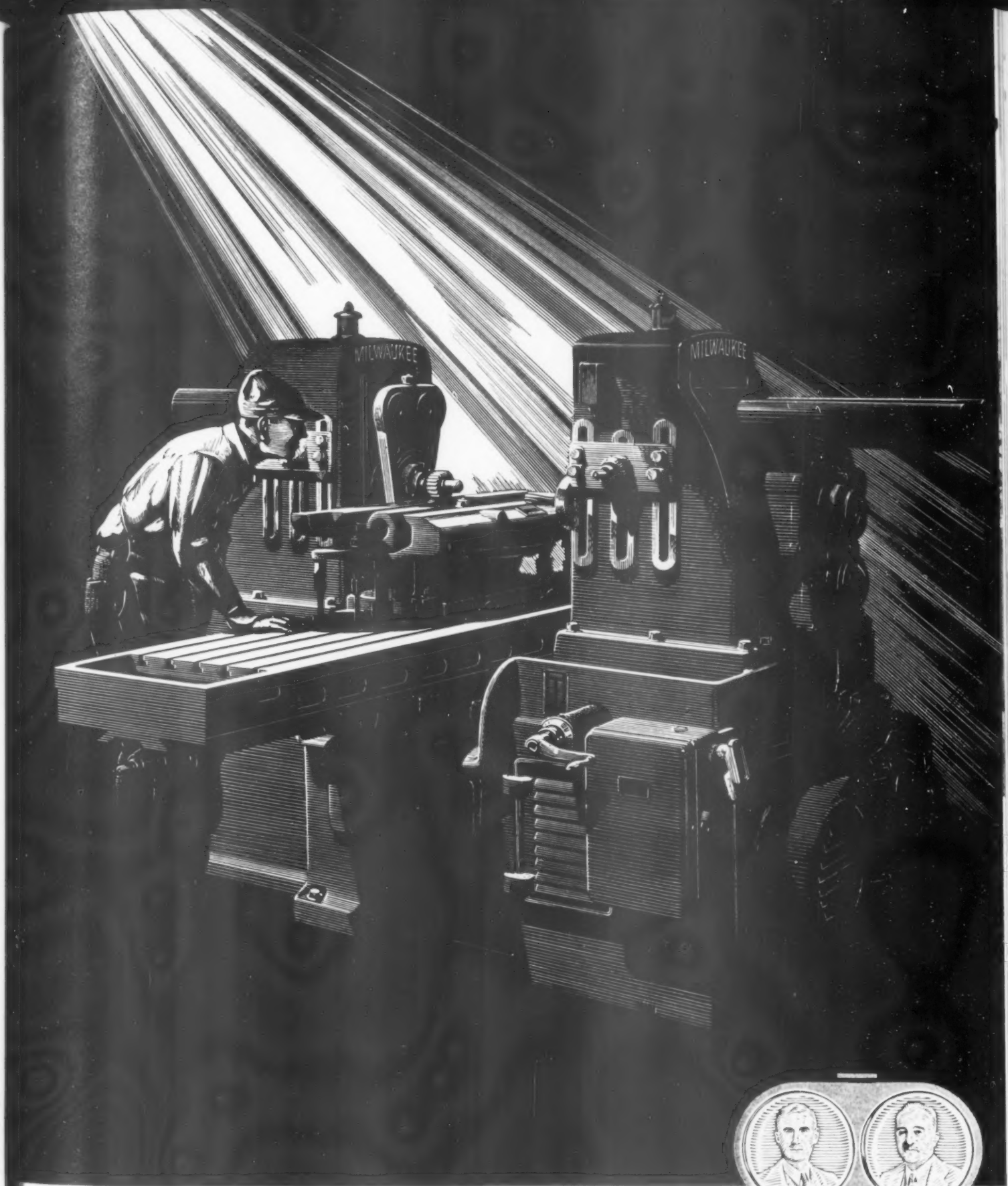
Wichita: Carl A. Burnham, Chairman; Charles C. Colvin, Secretary, 645 N. Volutsia, Wichita, Kan.

Williamsport: Ed L. Greer, Chairman; Louis Bleicher, Secretary, 300 Randall Circle, Penn Vole, Williamsport, Pa.

Worcester: Leslie A. Goff, Chairman; Harvey M. Allison, c/o John Bath Co., 18 Grafton St., Worcester, Mass.

(York) Central Pennsylvania: Ivan E. Grass, Chairman; Luther Loucks, Secretary, 457 Atlantic Ave., York, Pa.

Application blanks and information pertaining to membership in the American Society of Tool Engineers may be had by addressing The Tool Engineer, 2842 W. Grand Blvd., Detroit, Mich.; or the Secretary's office, 2567 W. Grand Blvd., Detroit, Mich. Senior initiation fee is $5. Dues $8 per year for senior grade membership and $5 per year for junior grade membership. Junior initiation fee $2.



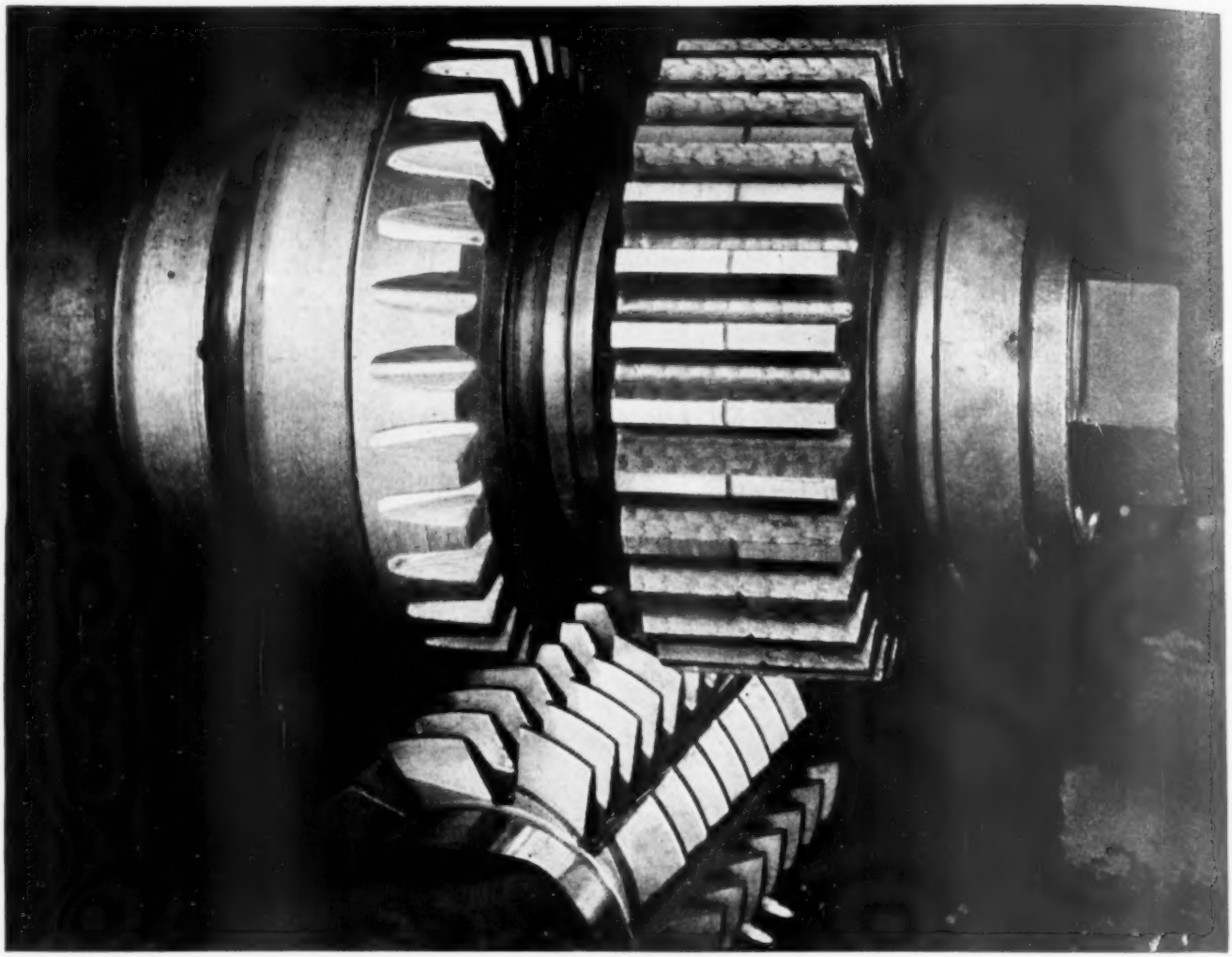
An application which emphasizes the extreme flexibility of the Milwaukee Duplex Milling Machine.

KEARNEY & TRECKER
CORPORATION
Milwaukee
MILLING MACHINES

Every cut counts on the production line . . . in bringing Victory on the firing line.

KEARNEY & TRECKER CORP., MILWAUKEE, WIS., U. S. A.

Milwaukee MILLING MACHINES



Like a Beaver Going Through a Sapling...

The beaver is one of nature's fastest and cleverest workmen, and uses his highly developed incisors as exceptionally efficient cutting tools.

DATA ON THIS JOB

Part — High and third speed tractor transmission gear.

Material — SAE 5145 steel, 43-48 carbon.

Outside Diameter — 4.414".

Depth of Cut — .321".

Holding Means — On arbor between centers.

Hob — B-C *Hi*-Production 3" dia., 3⅛" long, 1¼" hole, double thread, unground.

Machine — G & E No. 12.

Production — See text.

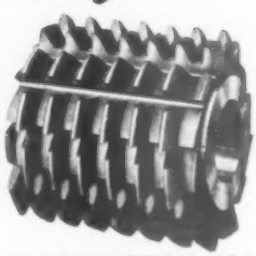
NATURE designed the beaver's teeth for extra strength and fast cutting . . . Barber-Colman engineers designed the special teeth of B-C *Hi*-Production Hobs with similar ideas in mind. The amazing speed and efficiency of the beaver cutting up a sapling for his dam is paralleled by the extraordinary cutting power of these B-C Hobs on production roughing jobs.

B-C *Hi*-PRODUCTION HOBS ROUGH 28 TRANSMISSION GEARS AN HOUR

Four tractor transmission gears, over 4" diameter and with ¾" face, 29 teeth, 7 pitch, are loaded in facing pairs as shown. With a hob speed of 140 r.p.m. and a feed of .080" per revolution of work, cutting time for the load is only 5.2 min. Net production, allowing for loading time, hob changes, and operator efficiency, is 28 pieces per hour. Accuracy calls for .005" maximum runout on root diameter and .015" stock on the teeth for finishing. The hobs give 5 settings, 32 pieces per setting, and 160 pieces per grind.

SPECIAL TOOTH DESIGN GIVES GREATER CUTTING POWER

B-C *Hi*-Production Hobs have special teeth, designed for higher cutting efficiency, greater cutting clearance, longer life, and distribution of wear over a larger surface. This is accomplished by reducing the pressure angle, which increases the tooth surface at the tops of the teeth, by increasing the clearance on the leading sides of the teeth, and by using straight gashes and a positive rake for a shearing cut. Tests in comparison with conventional hobs show 10% to 50% greater production per unit of working time, and from 10% to 25% less power consumed.



***Hi*-PRODUCTION HOB**

Usually made with double lead. When you ask for a quotation, be sure to specify the number of teeth in the gear to be hobbed.

BARBER B-C COLMAN PRODUCTS

HOBS, HOBBING MACHINES, HOB SHARPENING MACHINES, REAMERS, REAMER SHARPENING MACHINES, MILLING CUTTERS, SPECIAL TOOLS

BARBER-COLMAN COMPANY

General Offices and Plant 213 Loomis Street, Rockford, Illinois, U. S. A.

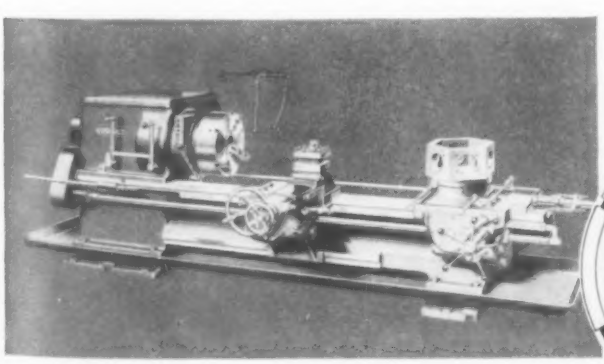
28 Days Make a Difference!

A NEW PLANT · A NEW MACHINE TO SPEED VICTORY

Just 28 days elapsed between the taking of these two photographs—from ground-breaking to new structure for the 50,000 square foot addition to the Gisholt Machine Company's Northern Works.

Days, hours, even minutes count now!

Rushed to completion in record time, this new addition to the Gisholt plant will provide facilities for a new department to be devoted exclusively to the manufacture of large turret lathes in two sizes. Even as you read this, we will be beginning to produce these machines in very large quantities to meet the urgent demands for more machine tools. Watch for a later announcement with regard to delivery dates. Gisholt Machine Company, 1229 Washington Avenue, Madison, Wisconsin.



THE NEW TURRET LATHES—to be known as the 3-R and 4-R, are modifications of the Gisholt 3-L and 4-L Heavy Duty Turret Lathes. (5¼″ and 9¼″ spindle bores; 21″ and 24″ chucks; 28½″ and 31″ swings.) Essential industries requiring machines of these sizes should place their names on our list *now* to receive literature when ready.

GISHOLT

Look Ahead—Keep Ahead—With Gisholt Improvements in Metal Turning

TURRET LATHES · AUTOMATIC LATHES · BALANCING MACHINES

DoAll★ meets the Challenge

This remarkable Contour Machine is speeding along the steady flow of vital equipment for army, navy and air force, by doing a lion's share of cutting tough metal and alloy parts of every description in airplane plants, arsenals, shipyards, etc.

On hundreds of production jobs, DoAll is doing a week's work in a day, a day's work in an hour, an hour's machining in 10 minutes, etc.

DoAlls range in price from $1,000 to $5,000 complete with necessary equipment; yet are relieving $10,000 to $50,000 machine tools of over-load work with valuable savings of time and metal.

AIRPLANE SKIS

Made on t
DoAll. Op
ator is cut
12 pieces
.0125—24
Duralumin
the same ti
A single ski
24 separa
cuts. Forme
cutting w
done, one a
time, wi
large he
shears.

DoAll Contour Sawing
BAND SAWING
BAND FILING
BAND POLISHING

★ Fastest Precision Method of Removing Metal

CONTINENTAL

Associated with the DoAll Company, Des Plaines, Ill., Manufacturers of Band Saws and Band Files for DoAll Contour Machines.

for faster PRODUCTION

Keep the planes, ships and bombers coming! That's the demand on American industry today. Every ounce of energy, every improved method to increase output must be used.

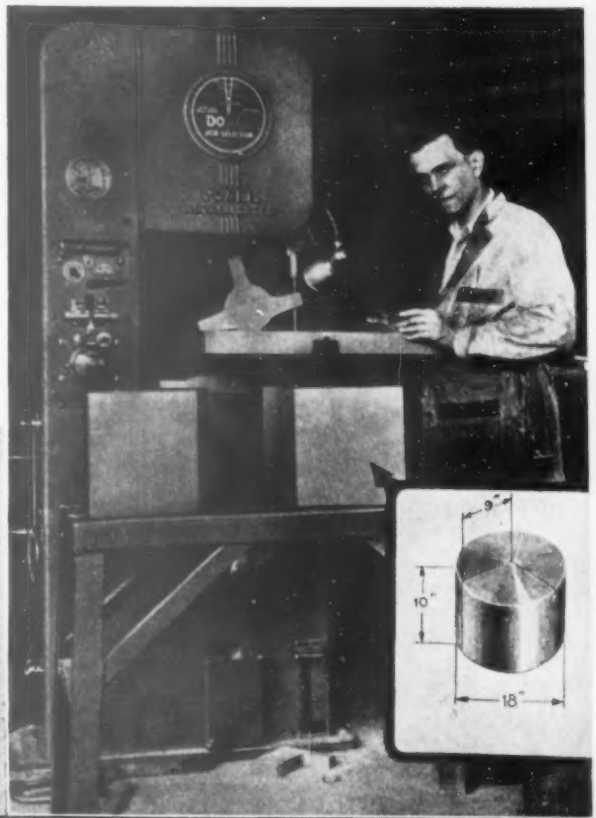
NOW . . . AND WHEN PEACE COMES

Whether you are doing war work on direct or sub-contract, you need the DoAll—the most versatile machine for production.

And—when the war is over, the DoAll won't have to be scrapped, but can be put to immediate work on your shelved peace-time orders, without changing a single nut or bolt.

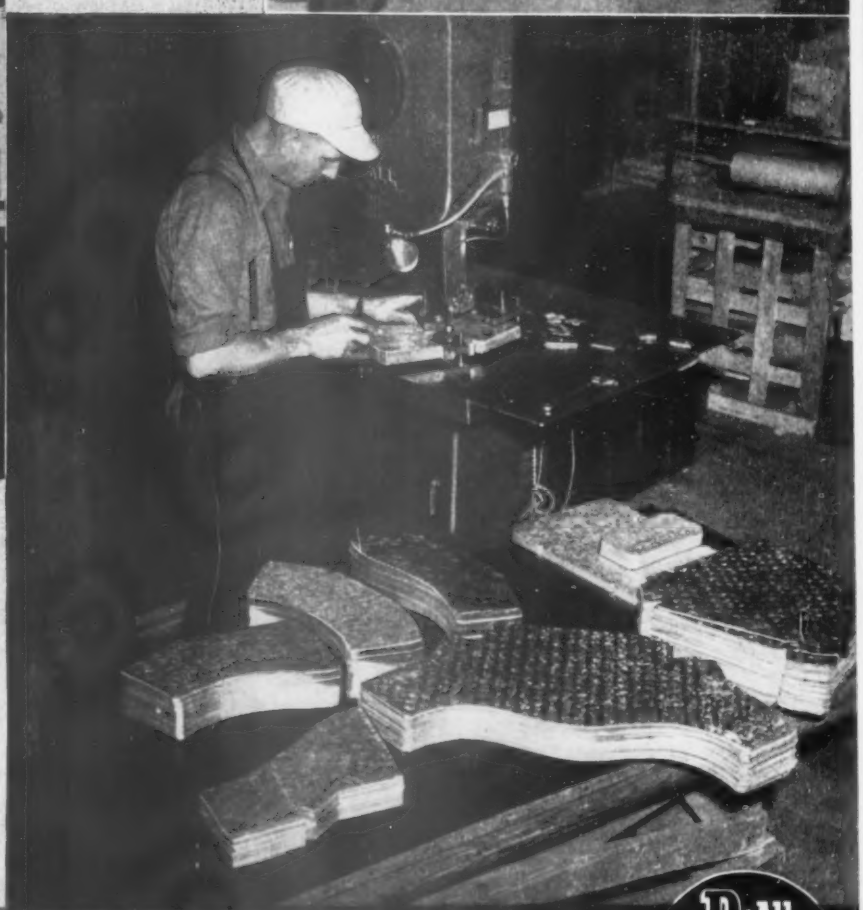
Available are 42 different sizes and styles of band saws, 3 band files, 3 polishers, a "best" one for every kind of work.

Let us send a factory trained man to show you just what the DoAll can do for you now and later.



AGITATOR MOLD

At Emmett Mold, Inc. This washing machine agitator mold was made in 13½ hours on the DoAll. Material is Chrome - Vanadium Steel 10" thick, 18" diam. weighing 720 pounds.



HAMMER DIE

At American Fork & Hoe Co. This 10" thick Hardtem Tool Steel Forging Die to make hammers was cut on the DoAll. Saving was about 60% in time and a great amount of metal, over any other method.

AIR CONDITIONING DUCTS

At Char - Gale Mfg. Co. 50 parts are cut at a time from 30-gauge galvanized iron. Operator can cut 1000 or more parts a day, which is 3 to 4 times faster than the old method, one at a time with hand tinsnips—and a much neater job.

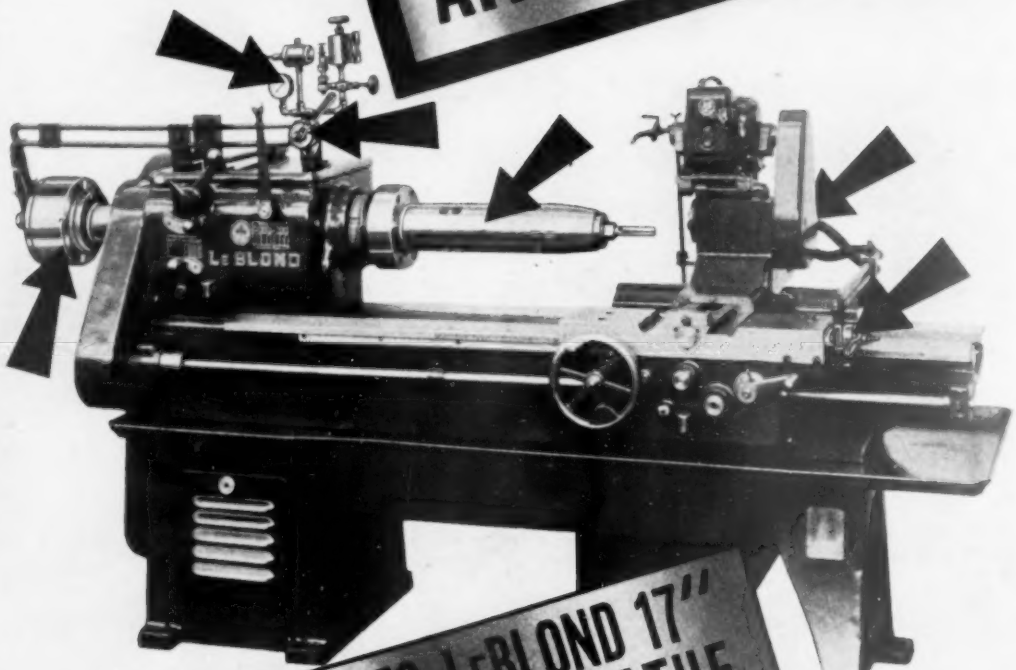
DoALL MACHINES, INC.

1304 S. Washington Ave. Minneapolis, Minn.

NEW — Send for the interesting and helpful book "DoAll on Production"

DoAll Contour Sawing
BAND SAWING
BAND FILING
BAND POLISHING

"LOGAN" AIR EQUIPMENT



AS APPLIED TO LeBLOND 17" RAPID PRODUCTION LATHE

THIS LeBlond Rapid Production Lathe is designed for the centering operation of shells. It is equipped with a "LOGAN" Model "R" Double Acting Rotating Type Air Cylinder to supply power efficiently, economically to a "LOGAN" 6-Jaw Expanding Mandrel. A Model "F" Non-Rotating Type "LOGAN" Air Cylinder (not shown in illustration) pulls the cross-slide quickly out of the way to load and unload the machine. In addition, this LeBlond Lathe is also equipped with a "LOGAN" Reducing Valve, Lubricator and Pressure Gauge Unit and "LOGAN" Model "TL" Air Control Valves. This "LOGAN" Air Equipment provides rapid, positive action and rigid support of the work. "LOGAN" Representatives and "LOGAN" Engineers will be glad to make recommendations on your problems.

★ **LOGANSPORT MACHINE, INCORPORATED** ★

902 PAYSON ROAD LOGANSPORT, INDIANA

Manufacturers of Air and Hydraulic Devices, Chucks, Cylinders, Valves, Presses and Accessories

Every pound of materials you save .... is a pound more for someone else TO USE !

LET US HELP YOU TO *Save Vital Alloys*

• Either as tools or as raw materials, alloy steels enter into the production of practically all war equipment. *Use these steels wisely; use them well!* That is an infallible way to speed up production; it is also the *only* way to conserve strategic materials . . . to spread the nation's supply of metals and alloys over the greatest possible amount of actual production.

Write us your alloy steel problems—you'll get your answer either in printed form, or in the personal assistance of our Technical and Field Service Staffs.

★ **SEND FOR THIS HANDY CALCULATOR . . . TO SAVE YOU TIME**

Just use the coupon below

in figuring the weights of alloy steel sections—shapes or flats.

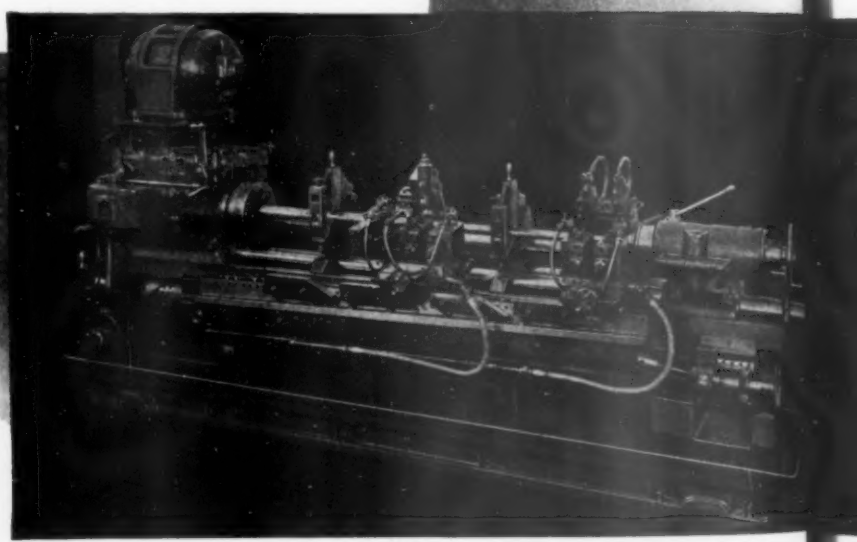
ALLEGHENY LUDLUM
STEEL CORPORATION — PITTSBURGH, PA.
Branch Offices in Principal Cities

ALLEGHENY LUDLUM STEEL CORPORATION
Oliver Building, Pittsburgh, Pa. T226
Send me a pocket Calculator (no obligation)

Name_____
Company_____
Address_____

A Sap-Hole at 12 Rods-

IN 1838 Dr. Story of West Parish, Windsor, Vermont, gave his nephew, young Dick Lawrence, permission to recondition the doctor's old squirrel rifle and mount a peep sight on it. When the job was finished they tested the rifle by firing three shots at a ¾" sap hole in a maple 12 rods away. Finding no new bullet holes in the tree trunk, the indignant doctor thought his rifle had been ruined — until he discovered to his amazement that all three bullets were in the sap hole itself! Thus Richard Lawrence won his first opportunity to rise to leadership in the gun shop of Nicainor Kendall, early direct predecessor of the modern Jones & Lamson Machine Company.



Jones & Lamson 12" x 81" Fay Automatic Lathe tooled to machine an aircraft cannon.

or a Tank at Half-a-Mile

In 1838 it may have been quite a feat to turn out a rifle that would put three bullets in a sap hole at 12 rods, but today's emergency demands accurate machine gun fire at 1500 yards, cannon that can hit a fast moving tank over half a mile away and antiaircraft guns that destroy five-mile-a-minute targets at 20,000 feet.

In any day and time, the technique of producing weapons that hit precisely where you aim them demands similar fundamentals of machine tool engineering and workmanship. Just as Lawrence understood those fundamentals and applied them in his generation, so did Robbins, Hubbard, Howe, Lamson, Hartness and scores of other engineers in Jones & Lamson Machine Company and its predecessor shops.

So do present day Jones & Lamson engineers design equipment that sets new standards of speed and accuracy today. Such are the Jones & Lamson Fay Automatic Lathes, pictured here on multiple tooled precision work on weapon barrels, capable also of cutting costs on peace-time tasks like shafts and spindles.

Here is another timely example of why it pays two ways to put production problems up to Jones & Lamson engineers. Why not see what they can do to help you? Inquiries from large plants or small receive thorough study here.

JONES & LAMSON

MACHINE COMPANY · Springfield, Vermont, U. S. A.

Jones & Lamson 8″ x 33″ Fay Automatic Lathe tooled to machine an automatic rifle barrel.

Manufacturers of Ram & Saddle Type Universal Turret Lathes . . . Fay Automatic Lathes . . . Automatic Thread Grinding Machines . . . Comparators . . . Automatic Opening Threading Dies and Chasers

J&L

PROFIT PRODUCING
MACHINE TOOLS

IT PAYS 5 WAYS

TO Standardize on EX-CELL-O THREAD GRINDERS

1 DESIGN . . . Ex-Cell-O engineers, who introduced precision thread grinding to U.S. industry, are familiar with today's threaded work needs. Ex-Cell-O thread grinders are designed to meet these needs specifically.

2 CONSTRUCTION . . . Ex-Cell-O thread grinders are substantially, compactly built—to give years of service—with base, work table, controls, compartments, etc., all integral parts of a uniform exterior design. Moving parts are made for *precision* operation. Work table slides, for instance, are heavily ribbed and normalized to eliminate warpage. Hardened, ground and lapped steel rollers support work table on scraped ways. Anti-friction rollers are retained in steel carriers so that table moves with uniform freedom, preventing variation of table drag that would affect accuracy of work.

3 ADAPTABILITY . . . Within the designed capacity of each of nine Ex-Cell-O standard thread grinding machines—automatics, universals, and plain production—a wide range of work is possible. Users of Ex-Cell-O precision thread grinders are finding that on many work pieces more overall speed and economy are attained by precision grinding *all* threads called for, including even those not requiring the extreme accuracy of grinding.

4 WIDE VARIETY OF STYLES . . . Ex-Cell-O has developed precision thread grinding to cover the many requirements of American industry for precision threaded work. There are available nine different styles of Ex-Cell-O thread grinders—*all standard machines*—with greatest practical interchangeability in use of dressers and lead screw and nut assemblies.

5 MADE BY DEPENDABLE FIRM . . . Only one standard is acceptable at Ex-Cell-O—the greatest commercial accuracy it is possible to attain, whether it be in the designing of precision thread grinders or any of the various other precision machines and tools bearing the Ex-Cell-O name.

Above: *Ex-Cell-O Style 39-A . . . for precision grinding internally threaded work. One of nine styles of Ex-Cell-O standard thread grinders.*

BUY UNITED STATES DEFENSE BONDS AND STAMPS

Precision THREAD GRINDING, BORING AND LAPPING MACHINES, TOOL GRINDERS, HYDRAULIC POWER UNITS, GRINDING SPINDLES, BROACHES, CUTTING TOOLS, DRILL JIG BUSHINGS, PARTS

EX-CELL-O CORPORATION • DETROIT

Solve Replacement Problems

by Hard-Facing with Haynes Stellite Rods

AS replacement parts for industrial machines and equipment become increasingly hard to get, it is more important than ever to prolong the life of wearing parts now on the job. In many cases, this can be done most successfully by hard-facing with Haynes Stellite Company rods.

Hard-Face All Parts— Old and New

Old parts which are badly worn can often be reclaimed and armored against wear by applying Haynes Stellite rods. To assure maximum savings, it usually pays to hard-face new parts—*before* wear occurs. Then when long use finally does impair their efficiency, most parts can be hard-faced again and again for added service.

Other Advantages of Hard-Facing

The use of Haynes Stellite hard-facing materials frequently permits use of cheaper base metals—or makes possible the use of a readily available substitute base metal when the usual kind cannot be obtained. When cutting or scraping edges are hard-faced, they stay sharp longer, often reducing power consumption. Time out for repairs is cut down by hard-facing, and this helps maintain high production schedules. At the same time, hard-facing decreases maintenance work and solves many replacement problems. Wherever abrasion . . . impact . . . heat . . . or corrosion . . . take their toll, there's a Haynes Stellite rod to furnish lasting protection.

A Rod for Every Purpose

HAYNES STELLITE ROD—the original non-ferrous cobalt-chromium-tungsten hard-facing alloy—now available in three different grades—high in "red hardness," highly resistant to abrasion and corrosion—applied by oxy-acetylene or electric arc process.

HASCROME ROD—iron-base hard-facing rod containing chromium and manganese—work-hardens under impact—applied by oxy-acetylene or electric arc process.

HAYNES STELLITE "93" ROD—iron-base hard-facing alloy containing more than 40 per cent of alloy ingredients—hard and abrasion-resistant—applied by oxy-acetylene or electric arc process.

HAYSTELLITE INSERTS—cast tungsten carbide in 13 standard shapes and sizes—extremely resistant to abrasion—generally applied by oxy-acetylene process with high-strength steel rod as binder.

HAYSTELLITE TUBE ROD—tungsten carbide grains of 9 standard screen sizes in high-strength steel tubes—extremely wear-resistant—applied as hard-facing rod, generally by oxy-acetylene process.

HAYSTELLITE COMPOSITE ROD—tungsten carbide grains of 4 standard screen sizes uniformly distributed in high-strength steel binder—extremely wear-resistant—applied as hard-facing rod, generally by oxy-acetylene process.

HAYNES STELLITE TRADE MARK

Red hard, wear-resisting alloys of cobalt, chromium and tungsten

HAYNES STELLITE COMPANY

Unit of Union Carbide and Carbon Corporation

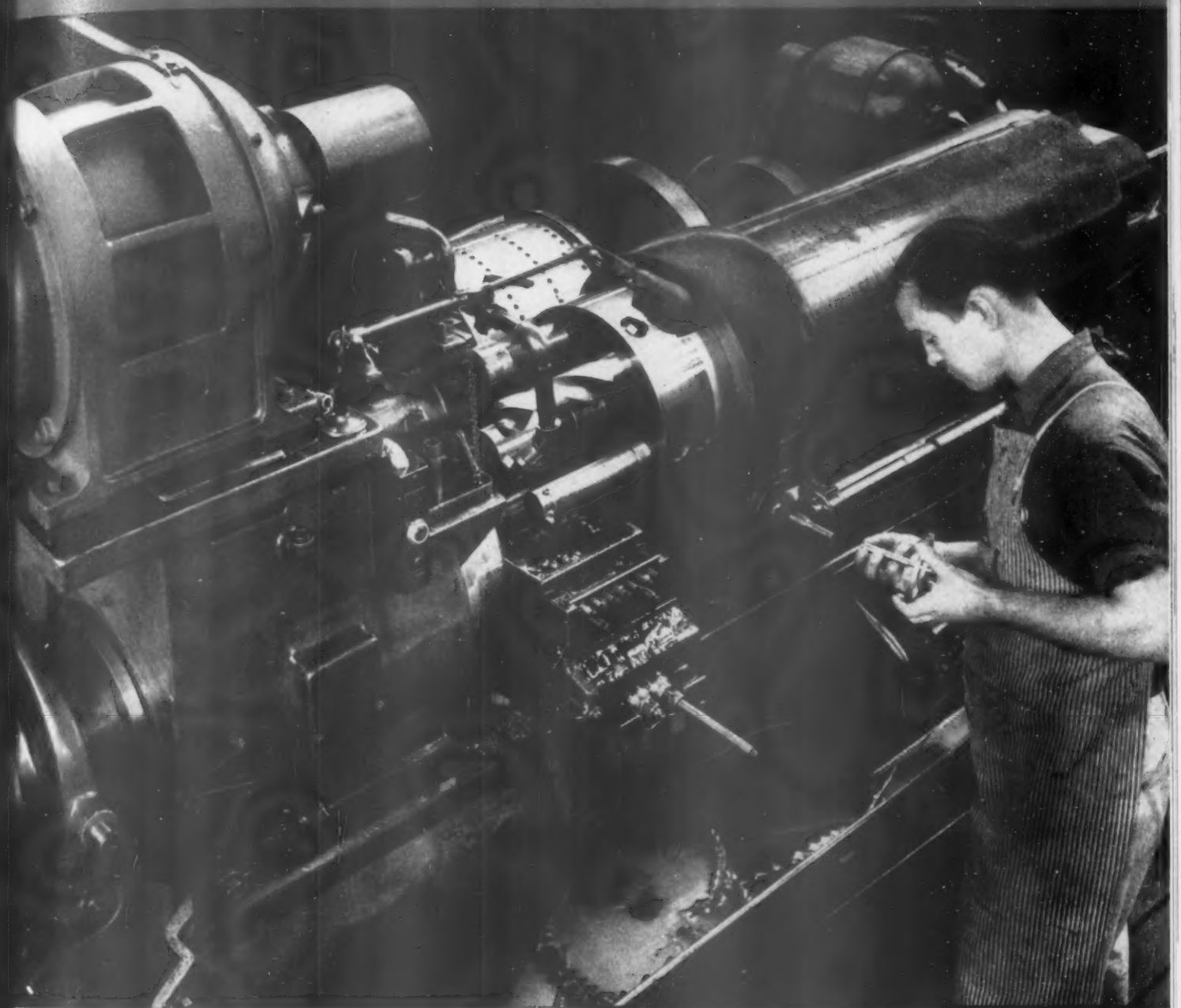
New York, N. Y. UCC Kokomo, Ind.

Chicago—Cleveland—Detroit—Houston—Los Angeles—San Francisco—Tulsa

• HEADQUARTERS FOR HARD-FACING MATERIALS •

"Haynes Stellite," "Haystellite" and "Hascrome" are registered trade-marks of Haynes Stellite Company.

PRATT & WHITNEY ENGINES COME OFF THE LINE FASTER WITH HELP OF *Model "A"*



• Here is one of the newest Cleveland *Single Spindle* Automatics, a 5¾-inch capacity Model A recently installed in a P & W plant in production on *small lots and short runs* of vital engine parts, made most economically on this type of machine tool. In the 3¾-inch size up to 8-inch capacity, Model A has a four-speed motor drive, universal camming and variable tool feed. In 1 1/16-inch to 2½-inch sizes constant speed drive is standard equipment, but two-speed drive is optional at slight additional cost. Ask for information on the size that might break a "bottleneck" for you.

THE CLEVELAND AUTOMATIC MACHINE COMPANY
2269 ASHLAND ROAD, CLEVELAND, OHIO

Sales Offices at:

Newark, 15 Washington Street • *Detroit*, 2842 W. Grand Boulevard
Chicago, 565 W. Washington St. • *Cincinnati*, 507 American Bldg.

CLEVELAND *Single Spindle* AUTOMATICS

MILLED AND BRAZED TOOLS

METHOD 2

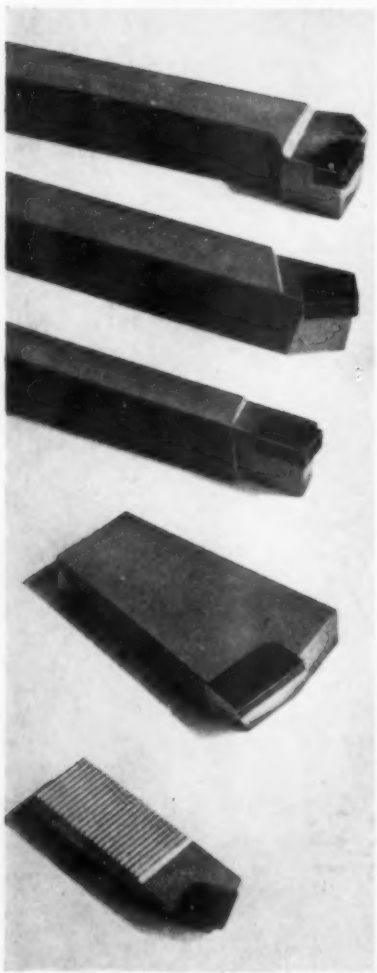
Vascoloy RAMET

T M REG U. S. PAT OFF

5-METHOD

COMPLETE TOOL SERVICE for MAXIMUM PRODUCTION

• • •



Typical Vascoloy-Ramet Milled and Brazed Tools

Vascoloy-Ramet Milled and Brazed Tools have a Ramet Cemented Carbide Blank brazed in place. Any size and shape, and a choice of over a dozen grades of Ramet Cemented Carbide Blanks can be used with any size and shape of shank. On this class of tools, the user does all the grinding to suit his tooling and cutting requirements.

Milled and Brazed Tools are meeting great favor among users of carbide tools. A wide variety of boring, turning and facing operations on steel, cast iron, and other materials are taken care of with a minimum tool inventory. Milled and Brazed Tools are taken from the tool crib and ground to suit particular requirements. In a majority of cases a finish ground tool ready to use can be made in fifteen to twenty minutes. Special and rush jobs can thus be tooled up with carbide tools in a short time.

With good deliveries still being maintained on a majority of Vascoloy-Ramet Milled and Brazed Tools, the economies and advantages of this class of tools, especially when ordered in quantities, merit their consideration by both large and small users of carbide tools.

VASCOLOY-RAMET CORPORATION

NORTH CHICAGO, ILLINOIS

DISTRICT SALES AND SERVICE IN PRINCIPAL CITIES

IN CANADA: Carbide Tool & Die Company, Ltd., Hamilton, Ont.

TANTALUM-TUNGSTEN CARBIDE

4222

FOR TOOL SERVICE..... *Specify* Vascoloy RAMET TOOLS

TANTUNG "G"

LODGE and SHIPLEY Put Airplane Quality Into Their Products

TODAY almost the entire Heald output of Bore-Matics is being used for precision finishing scores of parts for airplane engines to obtain the ultimate in accuracy and finish together with maximum production.

Four years ago while Lodge and Shipley were seeking similar quality for their lathes they also selected a Heald Bore-Matic. They tried it out on headstocks and tailstocks and the results, particularly in regard to alignment, were so satisfactory that they secured additional Heald Bore-Matics for numerous other parts such as control boxes, carriage aprons, quick change boxes, lead screw brackets, etc. Today these lathes are not only being built better, but what is more essential, faster than ever before, and in turn are being chosen to machine airplane parts since "Quality can best produce Quality."

If you have work that requires precision finishing let our engineers look over your problem and give you unbiased first hand information on how it can best be handled.

THE HEALD MACHINE CO., WORCESTER, MASS., U. S. A.

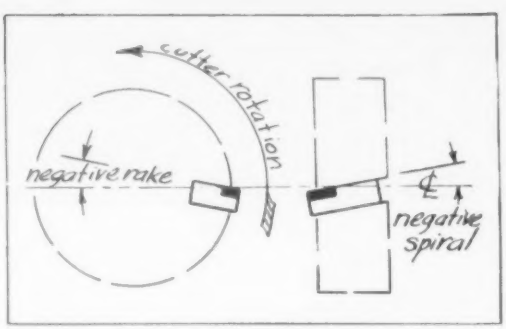
Now IT CAN BE DONE!

FIRTHITE **Negative Rake** Face Mills speed the milling of parts for all calibers and types of both naval and artillery cannon.

Hyper-speed FIRTHITE Mills multiply armament production of all high-strength alloy-steel equipment vital to our War Effort.

These cutters are operated up to TEN times the speed and SIX times the feed of high-speed steel mills.

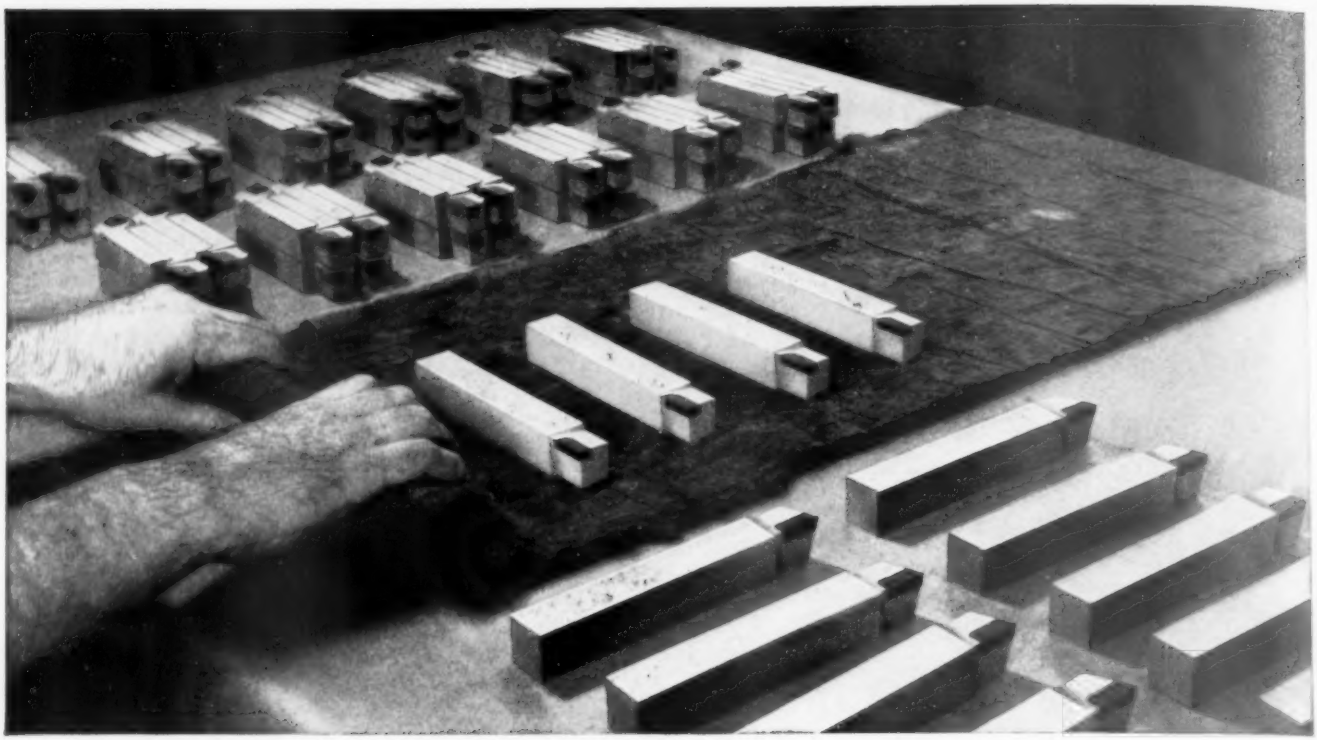
Complete face mills of this type are made by the OK TOOL COMPANY.



Design of FIRTHITE-tipped face mill for steel. Note: Both **rake** and **spiral** angles are NEGATIVE!

FIRTH-STERLING STEEL COMPANY

OFFICES:
McKEESPORT, PA.
NEW YORK CHICAGO
HARTFORD PHILADELPHIA
LOS ANGELES DAYTON
CLEVELAND DETROIT



These COULD BE THE STANDARD TOOLS YOU ORDERED *Yesterday*

If prompt delivery of standard cemented-carbide tipped tools is important to you, Carbide Fabricators can meet any of your current demands. Through steadily increasing production volume, complete stocks continue to be maintained—and, when required, delivery can be promised within 24 to 48 hours.

The standard tools now comprising the Carbide Fabricators line meet almost all your needs for turning, boring and facing jobs. Types are available for cutting of non-ferrous materials, cast iron, bronze, etc. and also for steel cutting. A simple "unit cost" method of pricing makes it possible to order the tools in any desired quantity, with no cost penalty being imposed when the smallest orders are filled.

In addition to standard tools, Carbide Fabricators are producing all types of special cemented-carbide tipped cutting tools . . . manufactured to the highest standards of accuracy and quality —and also *delivered promptly*. Here, in one smoothly-operating organization, is a most dependable source for all of your War Production needs for wear-resistant cutting tools.

Have You Received

. . . your copies of the new catalog of Carbide Fabricators standard tools? It provides the simplest and quickest procedure for selecting and ordering the tools you require in your present-day production. As many catalogs as you need will be supplied without obligation by your nearest Carbide Fabricators representative or will be mailed upon request directly from the factory.

We are Authorized Suppliers of Carboloy, Firthite and Vascoloy-Ramet Cemented-Carbides

CF *Carbide Fabricators* BERKLEY MICHIGAN

DIVISION OF MORSE TOOL COMPANY . DETROIT

TAPER TURNING CAPACITY STEPPED UP BY THE *Phantom Gear*

ASK ANY USER what he thinks of Monarch's Anti-friction Bearing Taper Attachment and Taper Attachment Variator. You'll find that these improvements, pioneered by Monarch, are setting new records for accuracy, smoothness and speed, in turning tapers from 0 to 94 degree included angle . . . qualities not possible on a lathe before the advent of these Monarch devices.

Like other Monarch developments, these practical improvements spring from our desire to maintain our forward march toward more useful lathes. This combination of courage, initiative, open-mindedness and hard work has gained the name, here at Monarch, of "*The Phantom Gear.*" This spirit constantly inspires us to keep Monarch lathes always at the peak of quality, even during the present peak of production.

* * *

Today, Monarch lathes are at work, day and night, producing implements for Victory. But, even the terrific grind to which they are being subjected will still leave them, when the emergency is over, ready to keep on producing more goods for more people, at lower cost.

THE MONARCH MACHINE TOOL COMPANY . . . SIDNEY . OHIO

Monarch's March of Progress

Wartime industry benefits today from such Monarch improvements as:

Anti-friction bearing taper attachment

Flanged spindle nose

Anti-friction bearing mountings for all rotating parts

Helical geared headstock

Automatic force feed lubrication

Flame-Hardened beds

Automatic sizing for all size lathes

When we return to peacetime production, American industry will continue to gain from *new* Monarch developments. It will pay you to keep in touch with Monarch.

MONARCH LATHES

COVER THE TURNING FIELD

Jobber Delivers Vital Equipment 8 months ahead!

Suppose you were manufacturing machine tools that were indispensable to War Production—and *Suppose* you required a new piece of gauging equipment for a high-precision job and held the necessary Priority but couldn't get factory delivery for at least 8 months:—

What then?

Well, if you were already making proper use of *your* Industrial Supply Distributor, you naturally would go to him first. And right there the "supposing" ends—for here is exactly what followed in that Manufacturer's experience:

He found his local Jobber:—

1—already had the Precision Gauge in stock;

2—had a Priority of his own that he could apply immediately;

3—The Jobber *could* and *did* deliver in a week.

Actually the Distributor's foresight enabled the Manufacturer to add the equal of ***2/3ds of a year*** to his priceless, all-too-limited production time.

Your own Jobber can and will help *you*—not so dramatically every time but always *soundly*—enabling you to co-operate with other manufacturers in increasing the Nation's total volume of fighting material.

You can depend on their teamwork—just as *we* have, during the many years in which Mill Supply Companies have served as this Company's exclusive Distributors of Cle-Forge High-Speed Drills and Peerless High-Speed Reamers over every square mile of Industrial America.

This incident is typical of the unusual services that many Mill Supply Distributors are rendering their customers during the Emergency.

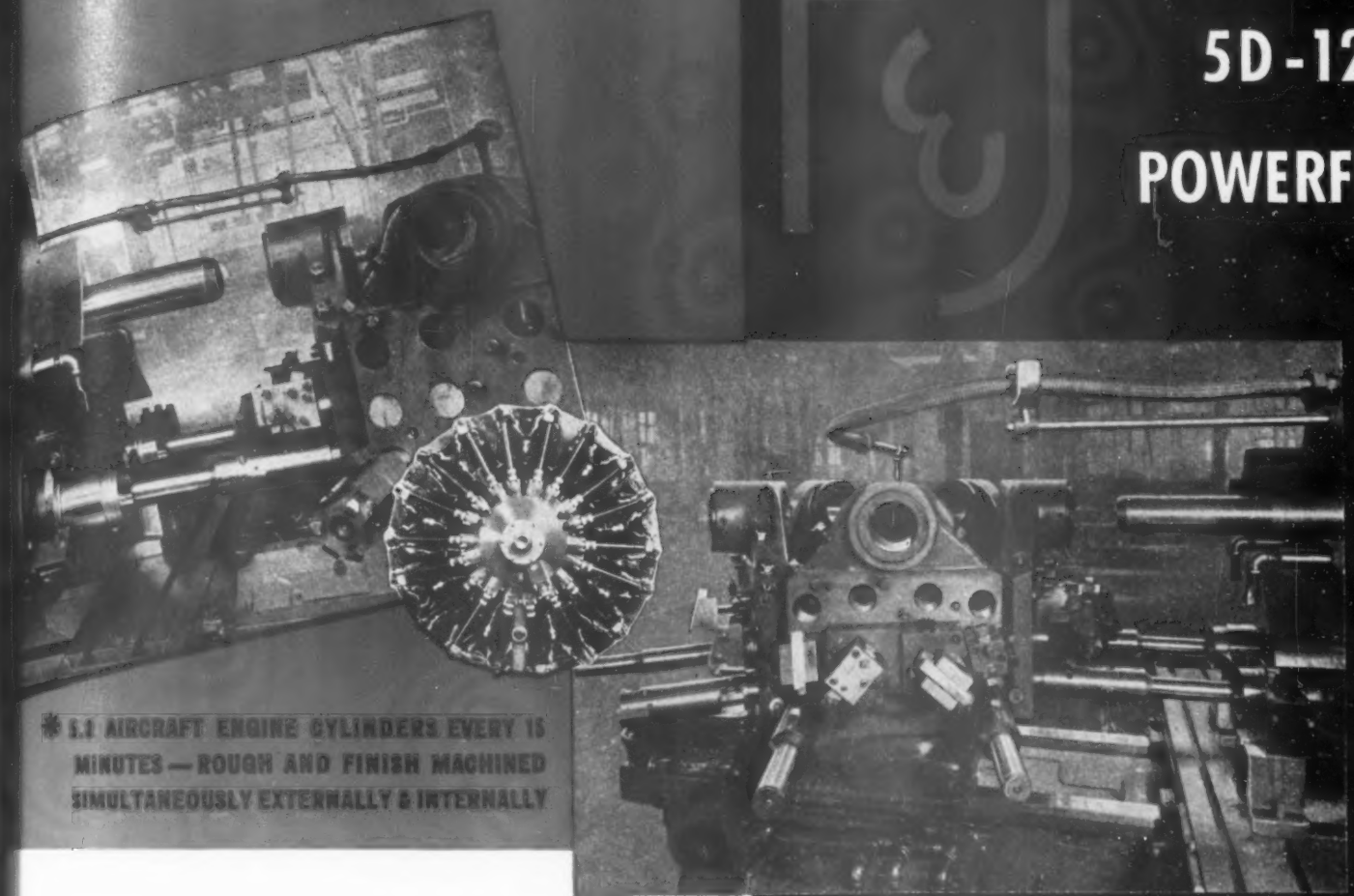
The CLEVELAND TWIST DRILL COMPANY
1242 EAST 49th STREET
CLEVELAND

TRADE MARK REG. U. S. PAT. OFF. AND FOREIGN COUNTRIES

30 READE ST. NEW YORK · 9 NORTH JEFFERSON ST. CHICAGO · 650 HOWARD ST. SAN FRANCISCO
6515 SECOND BLVD. DETROIT · LONDON - E. P. BARRUS, LTD. - 35-36-37 UPPER THAMES ST., E.C.4

"CLEVELAND" DISTRIBUTORS EVERYWHERE ARE READY TO SERVE YOU

*Results FROM PLANNED PRODUCTION ON A 5D-12 POWERFLEX



* 5.1 AIRCRAFT ENGINE CYLINDERS EVERY 15 MINUTES — ROUGH AND FINISH MACHINED SIMULTANEOUSLY EXTERNALLY & INTERNALLY

ugh the use of special tooling and a rigid type of overhead pilot, two spindle P&J machine set up in the plant of Lycoming Division, ation Manufacturing Corp., Williamsport, Pa. is an outstanding tribution to aircraft cylinder production.

ing for first or internal operation is mounted on turret in align- t with rear spindle while second or external operation is tooled n alignment with front spindle. The two holdings (one on each ect) are performed simultaneously, with a three jaw chuck and an operated fixture on rear and front spindles, respectively. One e of machine brings the rough machined steel forgings up to the ing operation handled on another type machine.

ddition to high productive capacity, the P&J Automatic assures ibility, ease of change over, minimum floor space, low power con- ption, rigidity and high finish accuracy. Many modern features of 5D12 Powerflex provide a machine which is ideal for aircraft engine t demanding economical production, extremely fine finish, accuracy heavy cutting under continuous operation.

operator can readily handle two or even three machines on this s of work.

OPERATIONS PERFORMED

REAR SPINDLE: (Presenting thread end to spindle)

1st T.F. — Loading Bar

2nd T.F. — Rough bore half way; rough turn 4.75"-4.841" dia.; rough face end; rough turn and straddle face flange; rough form groove.

3rd T.F. — Semi-finish above cuts; chamfer.

4th T.F. — Size turn 4.841" dia.

5th T.F. — Unloading

FRONT SPINDLE: (Presenting finished end to spindle. Locate in ring on 4.841" dia. and hold back against hardened and ground steel plate with 3 air operated fingers or clamps over flange).

1st T.F. — Loading

2nd T.F. — Rough bore hole half way; rough turn and face finished dia.; rough turn thread dia.; rough face end.

3rd T.F. — Semi-finish above cuts; chamfer corners; turn 4.910" dia.; bore hole through.

4th T.F. — Ream hole 4.608" dia. through

5th T.F. — Unloading bar.

POTTER & JOHNSTON MACHINE CO.

PAWTUCKET, RHODE ISLAND

The fixture for this special machine tool was designed and manufactured by this diesel engine manufacturer. The remainder of the machine, as shown below, is of our standard unit-type construction.

Diesel Engine Production Increased and Machine Delivery Improved with Unit-Type Construction*

You Can Save From 20 to 35% with Unit-Type Machine Tools

Initial cost of these special machines is lower because drawings and patterns are available. You save engineering and pattern costs on complete feed and drive units.

Boring, drilling, reaming, tapping, and milling operations can be done simultaneously. Best combination to suit your production is available. And, future changes in your part design won't cripple the machine—units can readily be re-arranged to accommodate changes.

FREE BOOKLET. This Bulletin gives complete information covering construction and application of a 3 H.P. unit. Write for your copy today . . . ask for the 75 B.H. folder.

TYPES OF MANUFACTURERS USING UNIT-TYPE MACHINE TOOLS

Automobiles — Airplanes
Air Conditioning
Gun and Armaments
Pencil Sharpeners
R. R. Equipment
Pipe and Fittings
Tractors — Trucks
Washing Machines
Oil Drilling Equipment
Hydraulic Equipment

W. F. & JOHN BARNES
ROCKFORD ILLINOIS

**This diesel engine manufacturer has made intelligent use of our engineering service. He manufactured the fixture and secured the tools while we manufactured the basic unit-type machine. For further information concerning unit-type machines see panel at the left.*

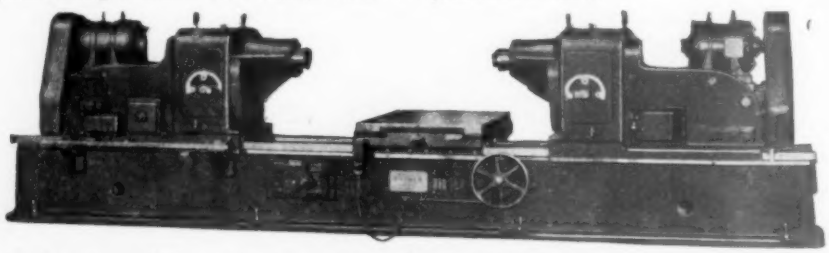
This is what this locomotive manufacturer (name on request) says about his unit-type diesel engine piston boring machine. Four different sizes of pistons are bored — both cast iron and aluminum. Production has been increased as much as 64% while maintaining the limits required for boring wrist pin holes.

Delivery of the machine was improved because the manufacturer designed and built the fixture and secured the tooling, while we designed and manufactured the basic two-way machine.

A standard hydraulic sliding head unit, with multiple speed head, is used on each end.

Perhaps this method of securing a production machine, in a shorter time, is possible in your plant. Investigate the advantages today . . . write for the descriptive bulletins offered below.

DELIVERIES are delayed when ordering is delayed, and since it takes longer to determine the correct machine for your specific job, than to order standard catalog equipment in quantity, we urge you to investigate the possibility of adapting unit-type machines to your production — today.

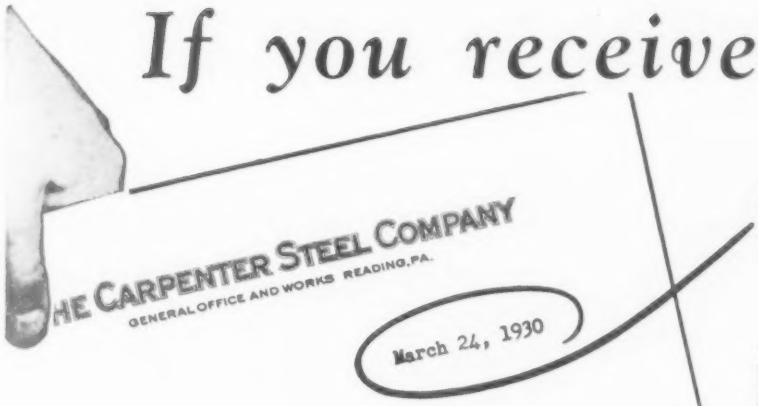


Basic unit-type horizontal duplex boring machine furnished to accommodate customer's fixture and tooling. The two opposed heads are self-contained hydraulic units powered with John S. Barnes hydraulics and provided with single spindle boring heads. With the exception of the fixture-table and boring heads, machine is of our standard unit construction.

FREE Production and Tooling Ideas

Not a catalog, but a set of eight bulletins describing a better way to get better machines. Each bulletin traces a machining problem from the original study of the part to the final machine design. Each may suggest a tooling or production set-up that you can use today — valuable file information for tomorrow. Write for bulletins T.E. 30 through T.E. 38.

If you received this letter



in March, 1930 . . .

. . . you were among the first to hear of Carpenter's program of *All Aid to Tool Steel Users.* Today, many years of experience enable us to provide a vital wartime service—helping to boost production and conserve precious tool steel.

Literally thousands of tool room supervisors and tool engineers have used this program. Reports from many plants show that Carpenter cooperation and assistance have been doing a lot to help . . .

step up machine output
conserve valuable metals
avoid hardening troubles
get longer tool life
train new men on the job
cut tool and production costs

If you can use help to accomplish those things—here is a program backed by years of research and experience in tool rooms and production plants.

As an immediate starter, we offer "Tool Steel Simplified". This handbook is being used in tool rooms, heat treating departments and machine shops to make every pound of tool steel contribute its share to *faster production.* It can help train apprentices faster. It can act as an excellent "refresher course" for the tool maker, while providing a useful reference source for tool engineers.

This handbook can help you overcome tool room problems *now,* and if at any time you are faced with a new problem, remember that the services of your nearby Carpenter representative and our Metallurgical Department are at your disposal.

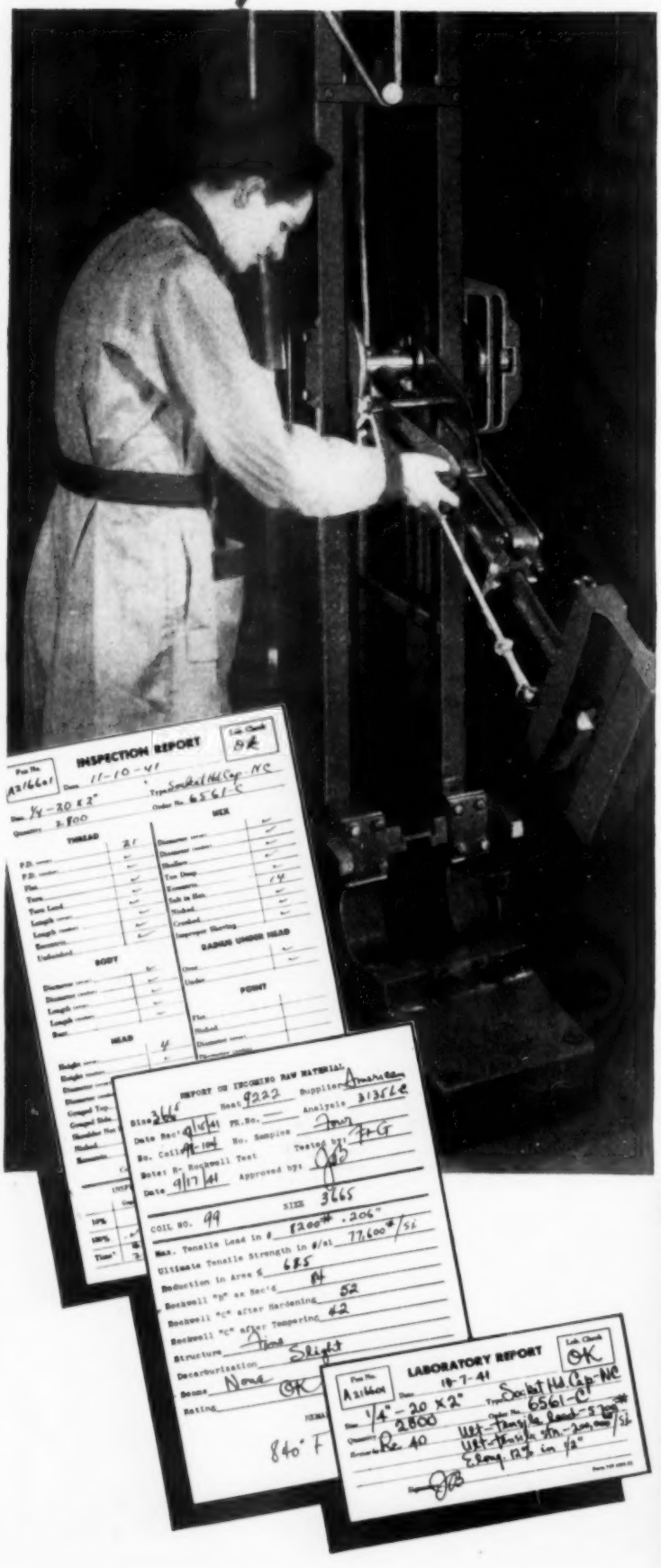
Over 25,000 copies of "Tool Steel Simplified" are helping to produce *better tools* that will do the jobs *more quickly.* It answers common questions on *eliminating tool warping, avoiding grinding checks* and *making tools wear longer.* Three chapters on heat treating procedure, and others on such subjects as "Trouble Shooting" and "The Relation of Design to Heat Treatment", make this 315-page handbook *must* reading for every man responsible for tools. "Tool Steel Simplified" is offered at cost—$1.00—to tool steel users in the U. S. A. ($3.50 elsewhere). After you have read it, you will want more men in your plant to have copies.

THE CARPENTER STEEL CO.
READING, PA. DEPT. 41

Carpenter MATCHED TOOL STEELS

IMPORTANT, BEFORE . . . VITAL NOW

Quality-Control Through Every Step!



-makes every PARKER-KALON SOCKET SCREW as perfect as a screw can be made...

PARKER-KALON'S Quality-Control Laboratory – without counterpart in the screw making industry – stands guard over every P-K Socket Screw produced. This is your assurance of 100% dependability! "Doubtful Screws" – screws that look all right but some of which fail to work right – have been eliminated by Parker-Kalon's step-by-step check-up routine.

Beginning with a careful analysis of the special alloy steel – strength factors, physical and working characteristics must surpass rigid specifications. Routine tests and inspections through every step of manufacture are your protection against even the slightest defect.

This protection may save you costly delays on the job – it's the big reason why essential industries specify PARKER-KALON SOCKET SCREWS on work that *must* keep moving! Parker-Kalon Corporation, 190-198 Varick Street, New York, N. Y.

Quality-Controlled

Complete test and inspection routine covers: Chemical Analysis; Tensile and Torsional Strength; Ductility; Shock Resistance under Tension and Shear; Hardness; Head diameter, height and concentricity; Socket shape, size, depth and centricality; Class 3 Fit Threads; Clean-starting Threads.

PARKER-KALON

Quality-Controlled

SOCKET SCREWS

Give the Green Light to Defense Assemblies

VICTORY STARTS HERE!

(Above) Partial view of Oster's enlarged factory facilities for greater production of No. 601 Turret Lathes. Oster plants located in Cleveland, Ohio and Erie, Pennsylvania.

(Below) The Oster No. 601, a SIMPLIFIED bar and chucking machine; power driven; equipped with 6-position, manually operated turret. Two optional drives: WORM drive and DIRECT drive.

● Months before war was declared, demands for the new Oster No. 601 Simplified Turret Lathe were a signal to increase factory space quickly. When the war broke, enlarged factory space was ready to absorb the still greater demands for those versatile bar and chucking machines. *Oster knew that Victory starts with production!*

Batteries of Oster No. 601s are now in action on first and second operation work in diversified war industries. Notable has been the success of those machines used to speed production of 20, 37 and 40mm shells. (Details on request).

Advantages of Oster No. 601 machines are explained graphically in Catalog No. 27-A. *Important memo:* The No. 601 costs less than $2000, without tools. Delivery? *12 WEEKS OR LESS!*

OSTER

Let's GO!

THE OSTER MFG. CO. • 2063 East 61st St., Cleveland, Ohio

Rush, by return mail ..... copies of Catalog No. 27-A which contains full description and detailed illustrations of No. 601 Turret Lathe.

NAME .....

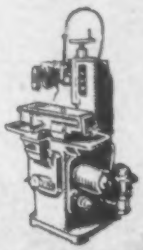
ADDRESS .....

CITY ..... STATE .....

Engineered Production

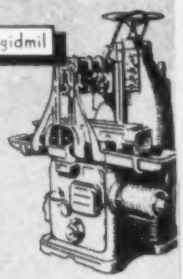
Quick Set-Up

Diagram shows how cycle of Sundstrand Automatic Lathe is set up quickly by adjusting dogs on graduated disc. Change-over is equally simple. There are no cycle-control cams to make, mount, or carry in stock.



No. 00 Rigidmil

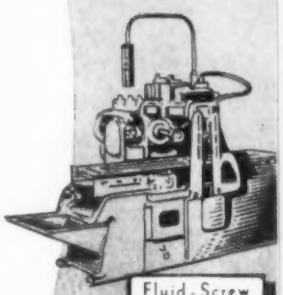
No. 0 Rigidmil



No. 1 Rigidmil

Get This Bulletin

You can learn quickly about advantages, features, cycles and specifications of Sundstrand Automatic Lathes by reading book shown above. Send for your copy today. Ask for Bulletin T-391.



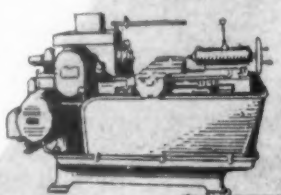
Fluid-Screw Rigidmil

Sundstrand Solves Tough Production Problems

A Problem . . . Shaft shown above was being turned out on bar stock 1 7/8" diameter by 9" long in 30 minutes on modern machine tool. Higher production and economy were required . . . but machine and operator were already working to capacity. This, and turning in lots of only 200 at present, made a tough problem.

Solved . . . Engineered Production on Sundstrand Automatic Lathe solved this problem. Turning is divided into four successive operations. Set-up and change-over are so simple, cutting speeds and rapid traverse so fast, that total Sundstrand turning time is 15.8 minutes per shaft, saving 14.2 minutes each. Sundstrand automatic cycle makes operator's part of this job easier, frees 50% of his time for other work.

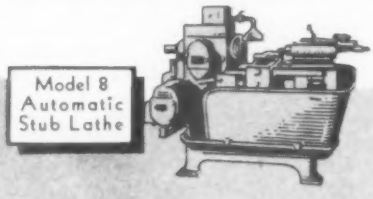
Plus Values . . . Nineteen other different work-pieces are turned on this lathe, with similar savings on all. Sundstrand tool relief reduces wear on front tools, eliminates drag marks. Sundstrand Engineered Production Service is available to all shops, small or large, to increase production, cut costs, and save labor on turning and milling. Investigate. Write for complete details.



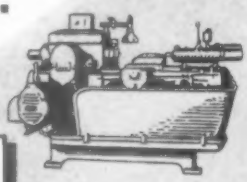
Model 12 Automatic Stub Lathe

Sundstrand Machine Tool Co.

2532 Eleventh Street, Rockford, Illinois, U. S. A.



Model 8 Automatic Stub Lathe



Model 10 Automatic Stub Lathe

In their respective fields, Sundstrand machine tools are unexcelled for high production, accuracy, and lasting value. Write for complete details.

RIGIDMILS · STUB LATHES

Hydraulic Operating Equipment — Drilling and Centering Machines

from Typist to MACHINIST

UNSKILLED HELP QUICKLY LEARNS

to produce perfect parts on Snyder *Automatic Cycle* Machines

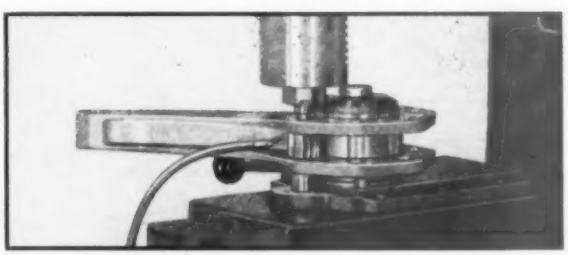
If you're having trouble finding enough skilled machine operators to increase production in your plant, let Snyder design and build *automatic cycle* machines for your milling, drilling, boring, turning and other precision operations. Here are three ways you can increase your production:

1. *Use unskilled help*—In a few minutes any average person can be shown how to tend an automatic machine. The operator loads the machine, and pushes a starting button. The machine cycle is hydraulically operated and electrically controlled.
2. *One operator* tends *several machines*—While one machine is going through its cycle automatically, the same unskilled operator can unload, load and start other automatic machines.
3. *One* machine does the work of *several* machines. One unskilled operator tending a high-production automatic machine can turn out as many parts as several skilled operators at manually operated machines.

Uniform Accuracy of output is designed and built into the automatic *machine*—it is not dependent upon the operator, as in the case of manually operated or controlled machines. The *production rate* of the automatic machine is likewise mechanically controlled, rather than dependent upon the operator—he can work longer hours without fatigue. *Safety* features of the automatic machine protect unskilled help.

You can use Snyder's experience in tooling up for quantity production of tank, ordnance, aircraft and other parts, either by a survey of your present equipment, or consultation on new set-ups. Snyder engineers await your call.

One Operator Tends Two Machines



The Snyder machine, above, mills the clearance for articulated rods in master rods for aircraft engines. This operation could be performed manually by a skilled mechanic on a standard lathe equipped with a special fixture; one unskilled operator tends two of these Snyder machines, however, because the cutting cycle is automatic (hydraulically operated and electrically controlled).

The close-up shows the full width of the clearance being finish cut on a solid master rod. The roughing operation on this rod is essentially the same, using a smaller cutter. The part is indexed for the next cut without unclamping. Split-type master rods can also be handled on this machine.

SNYDER
TOOL & ENGINEERING CO.
3400 E. Lafayette Ave. • Detroit

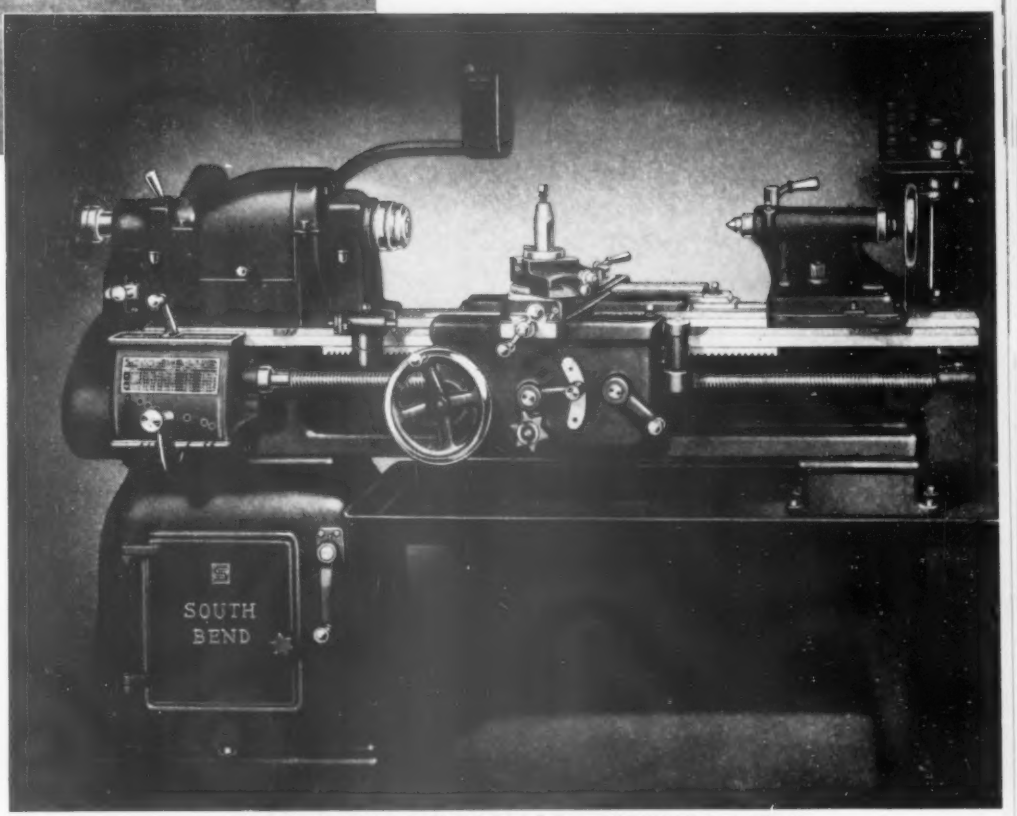
designers and builders of machinery for HIGH *production at* LOW *unit cost*

They Work Together *for* YOU

Yes, these two men are working together for you, a prospective user of South Bend Lathes. Together a shop foreman and a designer are finding the answer to one of the problems that must be solved to maintain South Bend standards of quality. Their friendly cooperation is typical of the shoulder to shoulder teamwork of our employees. This coordination of effort contributes much to the service and satisfaction you will receive from a South Bend Lathe. .

All of us, here at South Bend, are working together for you—and for National Defense. Production schedules have been doubled and redoubled. But no sacrifice in quality has been made—nor will there be any lowering of our standards.

South Bend Lathes are made in five sizes: 9″, 10″, 13″, 14½″ and 16″ swing, Toolroom and Manufacturing types. Each size is available in several bed lengths. Complete line of practical attachments, chucks and tools.



SOUTH BEND 16″ TOOLROOM PRECISION LATHE

SOUTH BEND LATHE DEALERS

Atlanta, Ga. . . . . Chandler Machinery Co.
Baltimore, Md. . . Carey Mchy. & Supply Co.
Boston (Cambridge), Mass. . Packard Mchy. Co.
Buffalo, N. Y. . . . . R. C. Neal Co., Inc.
Chicago, Ill. . . . . H. J. Volz Machinery Co.
Cleveland, Ohio. . . . Reynolds Machinery Co.
Dallas, Texas. . . Briggs-Weaver Machinery Co.
Denver, Col. . . . . M. L. Foss, Inc.
Detroit, Mich. . . . . Lee Machinery Co., Inc.
Houston, Texas. . . Wessendorff, Nelms & Co.
Indianapolis, Ind. . Marshall & Huschart Mchy.
Kansas City, Mo. . . . . Faeth Company
Los Angeles, Cal. . . Eccles & Davies Mchy. Co.
Memphis, Tenn. . . . . Lewis Supply Co.
Milwaukee, Wis. . W. A. Voell Machinery Co.
Newark, N. J. . . . . J. R. Edwards Mchy. Co.
New Orleans, La. . . . Dixie Mill Supply Co.
New York, N. Y. . . A. C. Colby Machinery Co.
Omaha, Nebr. . . . Fuchs Mchy. & Supply Co.
Philadelphia, Pa. . . . W. B. Rapp Machinery
Pittsburgh, Pa. . . . Tranter Manufacturing Co.
Providence, R. I. . Reynolds Machinery Co., Inc.
Rochester, N. Y. . . . . .Ogden R. Adams
St. Louis, Mo. . .Colcord-Wright Mchy. & Sup.
San Francisco, Cal. . . Moore Machinery Co.
Seattle, Wash. . . . . Star Machinery Co.
Toledo, Ohio. . . . . Reynolds Machinery Co.

SOUTH BEND LATHE WORKS

Lathe Builders For 35 Years

479 East Madison Street — South Bend, Indiana, U. S. A.

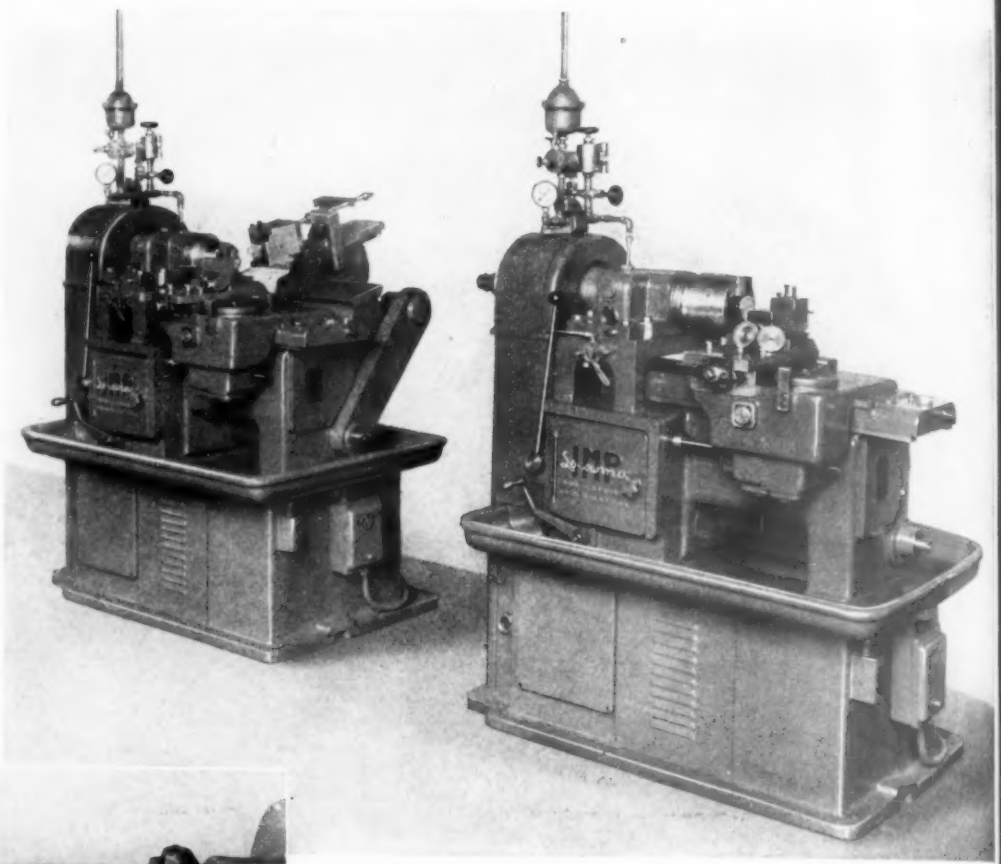
TRADE MARK SOUTH BEND TWIN ENGINE LATHES

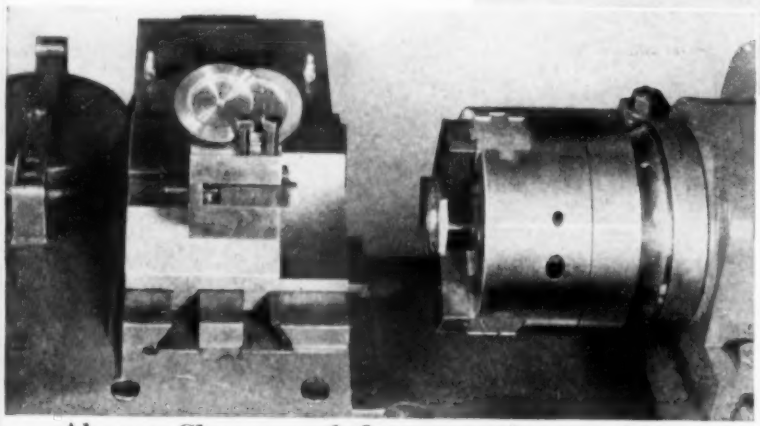
LET'S GO! U. KEEP 'EM FLY

MACHINE OF THE MONTH

PREPARED BY THE SENECA FALLS MACHINE CO. **"THE Lo-swing PEOPLE"** SENECA FALLS, NEW YORK

IMP LATHES MACHINE BOMB FUSE PART ON 2-OPERATION SET-UP





Above: Close-up of first-operation machine.

Below: Close-up of second-operation machine.

Problem: To face, undercut, turn and groove bronze bomb fuse parts on a production basis.

Solution: Two Lo-swing IMP Lathes were selected for this job since the size of the work (2-5/16" dia. x 3/16") was within the capacity of these high-speed machines. The first-operation IMP, seen at right above, locates the work from a previously-bored hole. An air-operated, compensating chuck grips it on the O D. Tools on the front cross slide face and undercut.

The second-operation IMP machines the reverse side of the part, again locating from the hole and driving with a compensating, internal jaw chuck. A tool on the front carriage turns the O D while tools on the back attachment face and groove. The facing tool relieves on the return stroke so as not to score the work.

Estimated production is 185 pieces per hour on the first-operation machine and 160 on the second —at 85% efficiency. All tools are cemented carbide.

LATHE NEWS from SENECA FALLS

18,500 lbs. of feed pressure!

WITH BAKER "Cleanline" DRILLS

This powerful vertical hydraulic feed machine with multiple spindle head is your answer for top performance and production. Its special cross index fixture is very successful for operations in magnesium material oil sump as used on 9 cylinder aircraft radial engines.

"CLEANLINE" stands for better shop appearance for this machine offers a clean design and is easy to keep clean for all major units are fully enclosed yet easily accessible.

This machine is adapted to heavy duty single and multiple spindle operations and is suited to drilling, boring, counterboring, facing, forming, and recessing operations.

MODEL 26-HO

BAKER

WRITE FOR NEW CIRCULAR AND ENGINEERING DATA SHEET

BAKER BROTHERS INC., TOLEDO, OHIO

DRILLING — BORING — TAPPING — KEYSEATING — CONTOUR GRINDING MACHINES

Call in the
Mill Supply Distributor-
your ally, friend and advisor

WITH the 168-hr. week have come frantic searches for materials, tools and supplies to keep production moving. And these are days when you'll appreciate more than ever the services of your local mill supply distributor.

He's the man who has anticipated many of your needs and has stocked thousands of items right in your city. His institution is the logical extension of your own purchasing department. If he hasn't just what you want, he'll try to get it. He never says, "It can't be done." Meanwhile he may suggest some alternative to serve you in the emergency.

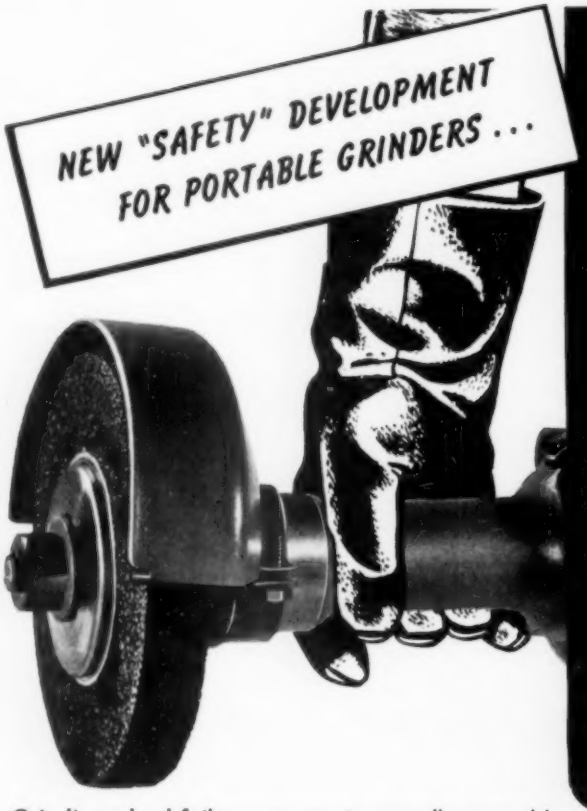
The mill supply distributor is no magician, but his efforts, added to your own, will most likely produce results that you can't achieve alone. He's demonstrating in 1942, as he has for years past, that he exercises a necessary economic function.

So call him in. If it's Barnes hack saw blades you need, or metal cutting band saws, the Barnes distributor *can deliver them.* What's more, he can suggest to your mechanics means for making these metal cutting tools last longer—do more work.

W. O. BARNES CO. INC.
DETROIT MICHIGAN

Specify Barnes Metal Cutting Saws, Hack and Band—
sold only through Mill Supply Distributors.

DETROIT BARNES U.S.A.

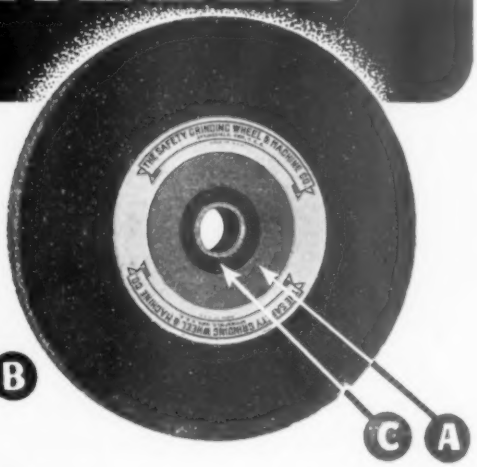


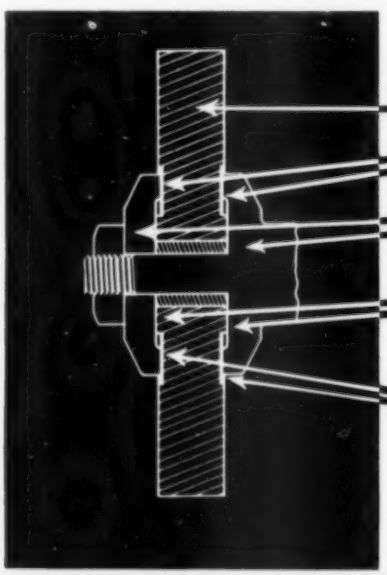
NEW "SAFETY" DEVELOPMENT FOR PORTABLE GRINDERS . . .

"SAFETY" GRIP-LOK GRINDING WHEELS

Grinding wheel failures are most generally caused by one of the following: 1—Injury during shipment, 2—incorrect mounting of the wheel, 3—Accidental injury during operation.

Insure against injuries, property damage and costly time delays by insisting on the portable grinding wheel which prevents a broken wheel from flying apart . . . the new SAFETY GRIP-LOK GRINDING WHEEL.





. . . HOW SAFETY GRIP-LOK WHEEL WORKS

1. Represents the abrasive wheel.
2. Safety Grip-Lok Wheel has annular recesses on both sides concentric with arbor hole.
3. Standard flange same as provided on all portable grinders.
4. Relief in flanges. When wheel is mounted and tightened flanges 3 enter recesses 2 and overhang ends of abrasive hub.
5. Resilient composition washer is located in recess 2 on both sides of wheel. When pressure is brought on washer, flanges 3 enter recesses 2 by compressing the washers.

When the flanges ("B" in photograph of collar above) compress the composition rubber and cork washer in the recess ("A" in photograph of wheel above) they allow the raised hub, "C", to come up under the recess of the flanges, "D", and act to prevent segments of a broken wheel from flying outwardly.

We can promptly supply "SAFETY" GRIP-LOK WHEELS in all grains and grades. For the phone number of the "Safety" Sales Office or Warehouse nearest you, consult the list below.

"REMEMBER PEARL HARBOR"

SAFETY

Established 1891

THE SAFETY GRINDING WHEEL & MACHINE CO.

Main Office and Factory SPRINGFIELD, OHIO, Phone 4651

• SALES OFFICE ★ SALES OFFICE and WAREHOUSE

• Birmingham—3-3323 ★ Chicago—Brunswick 2000 ★ Cleveland—Cedar 9292 ★ Detroit—Trinity 1-5420
★ Erie—25-687 • Houston—Preston 2381 ★ Philadelphia—Rittenhouse 6095 ★ Pittsburgh—Court 2822
• St. Paul—Nestor 7279 ★ St. Louis—Central 3787 ★ Syracuse—2-1377

THE superiority of the continuous tooth Herringbone gear is not only well known but universally recognized for its greater strength and smoother action resulting from increased tooth contact.

Sixteen speeds and forty-eight changes of threads and feeds assure the maximum possibilities from all types of cutting tools. Anti-friction bearings on all units and parts subject to radial or thrust loads and Timken precision bearings on the spindle transmits smooth, silent power from the gearing to the work.

These are but a few of the modern construction features found in Sidney Lathes that account for their ability to maintain close tolerances on production jobs and costs that make for increased profits on all lathe operations.

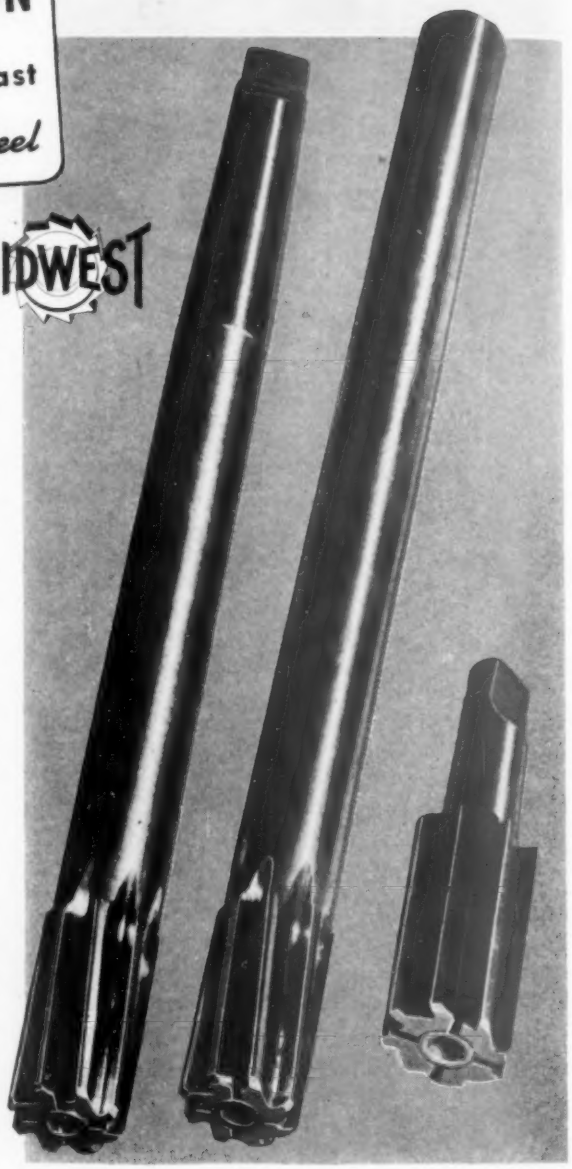
Built in 14" to 36" capacities to cover a wide range of manufacturing applications.

The SIDNEY MACHINE TOOL Company
SIDNEY U.S.A. OHIO

How MIDWEST EXPANSION REAMERS make fewer reamers last longer, help conserve *High Speed Steel*

ONE MIDWEST REAMER EQUALS THE LIFE OF 6-18 SOLID TYPE, HIGH SPEED REAMERS OF THE SAME SIZE.

MIDWEST



These reamers, quickly and easily expanded oversize to compensate for wear or to slightly increase reaming diameter, represent the equivalent of one more high speed solid type reamer each time they are expanded. And the delay and cost in securing additional reamers are avoided. The smaller sizes can be adjusted approximately 1/64″; the larger ones, almost 1/16″.

Simple and Accurate Adjusting

The end of the expanding plug is provided with a hexagonal hole and is adjusted with a small hex wrench. Expanding the reamer is thus a simple, quick operation of a few seconds, and the screw action permits very accurate adjustments.

They Help Save High Speed Steel

Midwest expansion reamers are made with a tough, alloy shank giving strength and elasticity back where strain occurs, and with a welded high speed steel cutting end; thus combining adequate strength and wearing qualities with conservation of high speed steel.

Save and Conserve

We can't all fight with weapons but there are ways in which each of us can help win the fight; we can save, conserve and use with utmost care every tool, every piece of equipment, every bit of material which can in any way contribute to our winning the war . . . and to help equip our fighting men, we can buy defense bonds and stamps.

MIDWEST

Precision METAL CUTTING TOOLS

END MILLS • SLEEVES • COUNTERBORES • SPECIAL TOOLS • DRILLS REAMERS • FORM TOOLS CARBIDE TIPPED TOOLS ADJUSTABLE HOLDERS

MIDWEST TOOL & MFG. CO. • 2364 W. JEFFERSON AVE. • DETROIT, MICHIGAN

The SUNNEN PRECISION HONING MACHINE

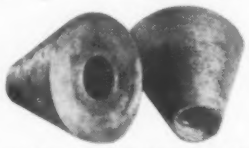
handles jobs like these faster, more accurately, at lower cost

Bronze Valve. The Sunnen method of honing is used to secure a high finish and accuracy.

Inner Bearing Ring "Accurately removes last 'tenth' of stock."

Aluminum Aircraft Link "produces high finish without bell-mouthing."

Diesel Engine Fuel Injector Cylinder "So accurate that a piston can be fit within .00005" inch."

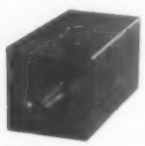


Cones for Wheel Balancing Machine "Accurately align hones two interrupted surfaces."

Airplane Engine Parts accurately honed to a super-smooth finish.

"Strict alignment maintained between two holes."

Drawing and Blanking Die "Saves time in producing smooth base metal finish."



Saved time in producing a smooth accurate finish on this bronze remote control valve body.

"Produced an extremely accurate and glass-like finish."

Aviation Hydraulic Cylinder made of Aluminum-Alloy. Improves the quality of the bearing surface. An extremely smooth surface-finish is secured.

Mild Steel Clevis. Honing was used to correct errors of previous machining and maintain true alignment of the two bearing surfaces of this clevis.

Hardened Steel Inner Bearing Race honed to .00005" limit. Surface finish improved; errors of out-of-roundness eliminated.

Aircraft Valve Tappet Roller. 4-Micro finish.

Write for
FREE BULLETIN

Giving complete information and showing many examples of use. Or if you prefer, we'll have a sales engineer call and demonstrate this equipment in your plant on your job.

Solve your problems of finishing internal cylindrical surfaces with this inexpensive, yet accurate, honing machine. Relieves big internal grinders for other jobs. Can be set up and work located in a minute. Does not require skilled labor — workers in "teens" can handle jobs in "tenths."

Range .185" to 2.400" — accuracy guaranteed within .0001". Now being used by hundreds of manufacturers handling important war contracts.

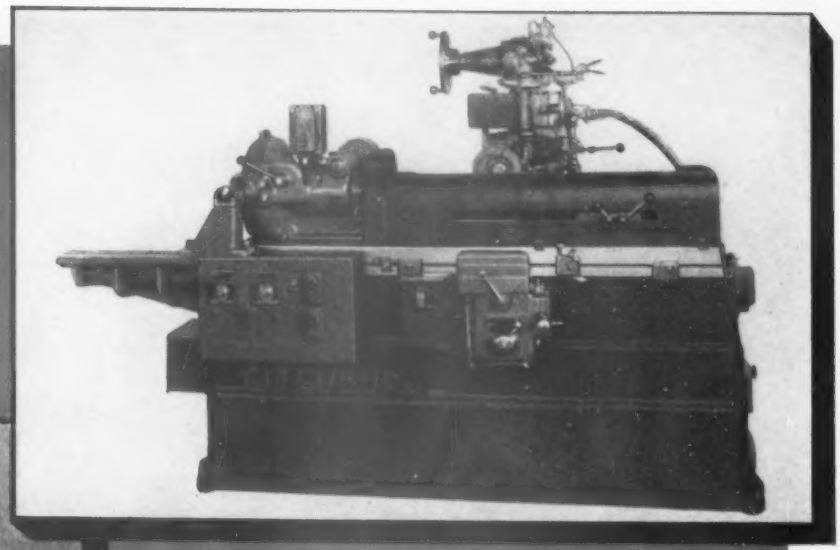
Corrects errors of out-of-roundness or taper caused by previous operations. Produces super-smooth finishes. Maintains alignment established by previous operations. Facilitates duplication of sizes.

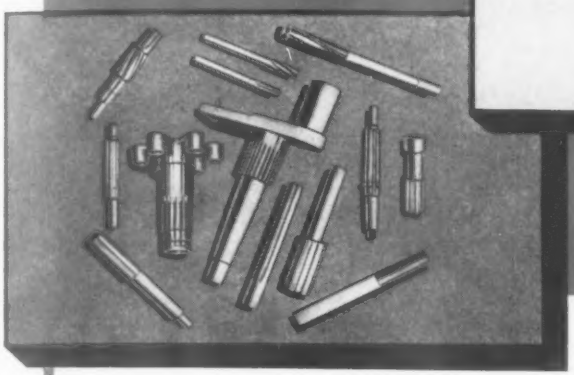
SUNNEN PRODUCTS CO. 7932 Manchester Ave., St. Louis, Mo.
Canadian Factory: Chatham, Ontario

SUNNEN

FITCHBURG

Automatic Closed Cycle Grinding





Assures

ACCURATE SPLINES

Fitchburg formed wheel grinding method with automatic closed cycle, produces splines and gears with finer finish — higher degree of accuracy — higher speed in operation, resulting in smoother product performance.

Fitchburg technique also permits new operators to be quickly trained to produce accurate work — an important factor in speeding war production.

Fitchburg Grinding Equipment is in successful use in the largest industrial plants in the United States. Every day it is saving man hours.

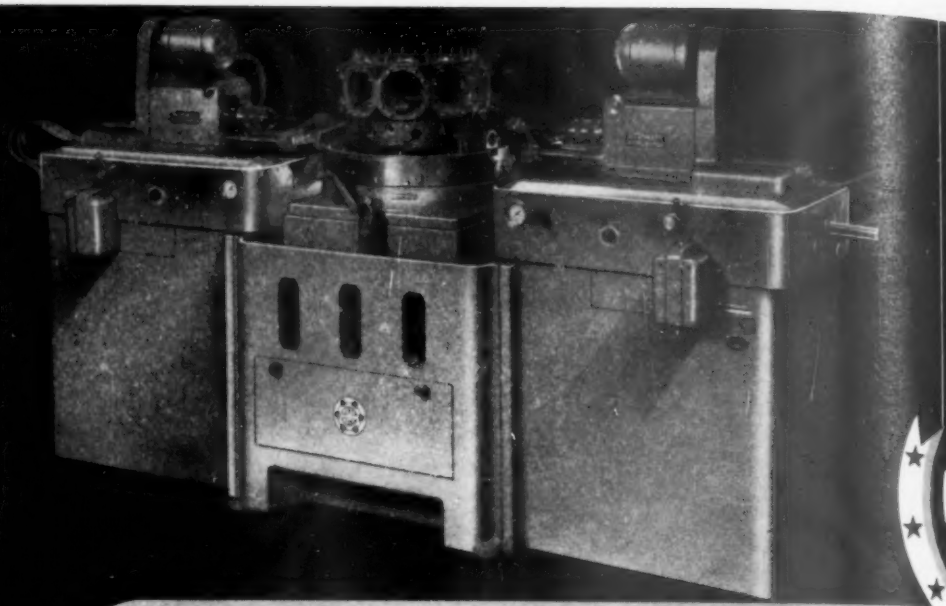
If you have any work of this character let Fitchburg engineers show you how to speed production by this modern grinding method.

Write today for this catalog showing wide range of successful operations.

FITCHBURG GRINDING MACHINE CORP.

FITCHBURG, MASSACHUSETTS, U. S. A.

Manufacturers of — Bowgage Wheelhead Units, Multiple Precision Grinding Units, Spline Grinders, Cylindrical Grinders, Gear Grinders, Bath Full Universal Grinders and Special Purpose Grinders.



Honing valve guides after assembly in crankcase (Radial Aircraft Engine) on Double End Hydrohoner with Micr-O-Size control — production 3 to 6 complete assemblies per hour — removes average of .0005" to .001" stock per bore — generates uniform size within .0003" to .0005", accuracy within .0001" to .0003" and surface finish within 3 to 5 micro-inches, r.m.s.

AIRCRAFT···—

FOR VICTORY PRODUCTION

SAVE TIME

SAVE METAL

SAVE COST

IMPROVE QUALITY

AIRCRAFT···—

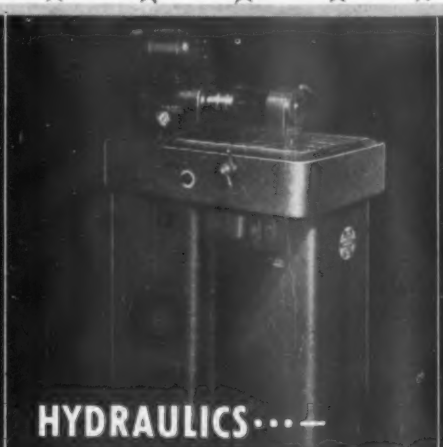
Feathering Oil Pump Gear Teeth (Aircraft Engine) external honing.

AIRCRAFT···—

Honing Piston Pin Bores (Aircraft Engine).

AIRCRAFT···—

Honing Valve Guides (Aircraft Engine) before assembly.

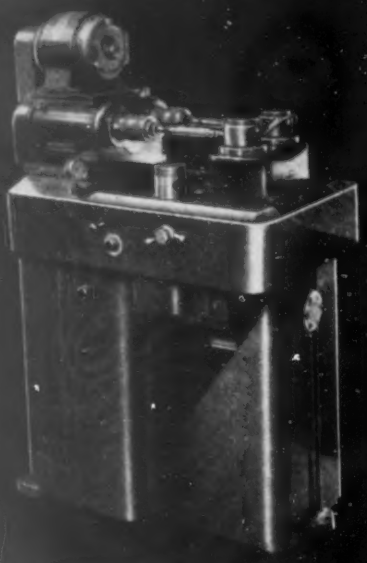


HYDRAULICS···—

Honing O.D. of pistons for a variable delivery pump.

Honing cast iron valve guides on full automatic Hydrohoner with Micr-O-Size control—Production 250 pieces per hour. Average Stock removed, .0015" to .0025"—Size within .0005" tolerance; accuracy within .0001" to .0002"; surface finish within 3 to 5 microinches, r.m.s.

Honing Piston Pin holes (in Piston) on Double Spindle Hydrohoner with Micr-O-Size control.



AUTOMOTIVE····—

Microhoning has been adopted in most armament production shops to speed up the final processing operation on vital bearing surfaces.

Microhoning generates final surfaces with the minimum amount of stock removal.

Microhoning saves sufficient processing time and cost in some installations, it is reported—even *to pay for the machine in 30 to 40 operating days.*

Microhoning controls cutting pressure, speed and motion to produce maximum obtainable quality of generated surfaces.

Write for Bulletins AR60 and AR64 for further details.

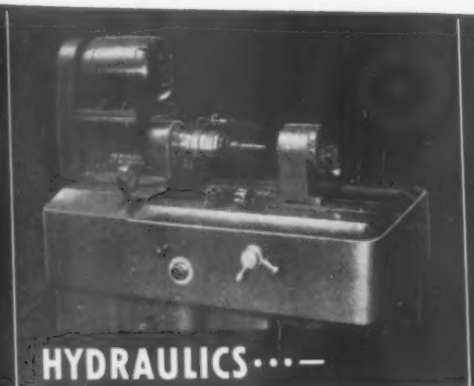
PHONE DETROIT
TRINITY 1-1300

MICROMATIC HONE CORPORATION

1345 E. MILWAUKEE AVE. DETROIT, MICHIGAN

ORDNANCE····—

Double Spindle Hydrohoner with Micr-O-Size control for honing gun charger tube bores.



HYDRAULICS····—

Honing blind end bores in a variable delivery pump body.

HYDRAULICS····—

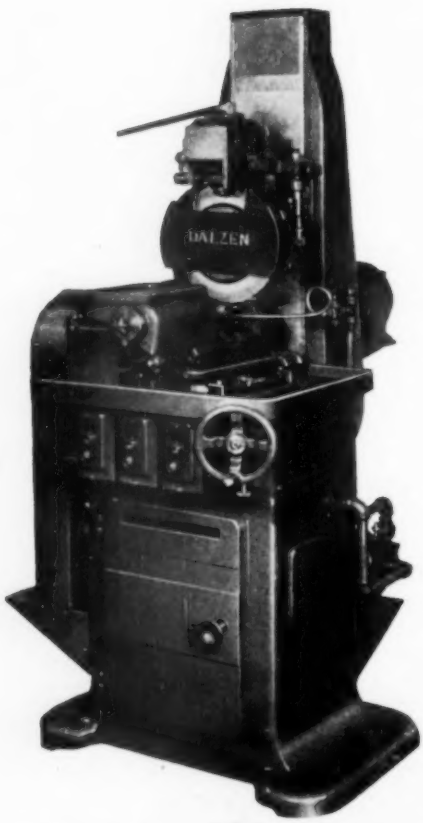
Honing bores in hydraulic valve body on Micromatic Hydrohoner.

ORDNANCE····—

Honing pinion shaft bores in hardened planetary gear for military vehicle.

9 out of 10 THREADING JOBS Can be Ground on the —

NEW DALZEN NO. 2 THREAD GRINDER



SAVE FLOOR SPACE, TOO!

The problem of trying to work the required amount of machine tools into a given amount of floor space is solved by this DALZEN VERTICAL THREAD GRINDER which takes little more than half the space formerly required for the production of ground threads. The machine is only 39" deep, 43" wide and 72" high. At the extreme, floor space would measure only 39" x 48."

Constructed in a vertical position, the head of this DALZEN VERTICAL THREAD GRINDER is always exerting a downward pressure directly over its base—thus the weight never shifts to alter the line of equilibrium. Therefore, a natural condition exists which assures absolute precision in the size of the work.

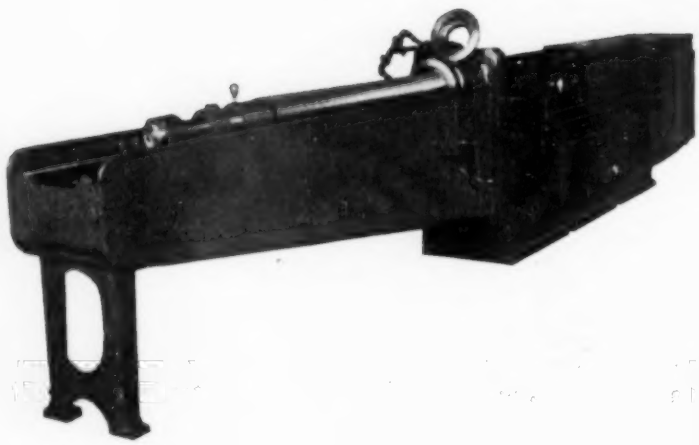
This versatile grinder will grind threads up to four inches in length anywhere on an eight-inch shaft with a diameter maximum of three inches. The fixture pivots and can be set accurately to a maximum helix angle of 15 deg. either side of center to produce right or left hand threads in standard or special forms.

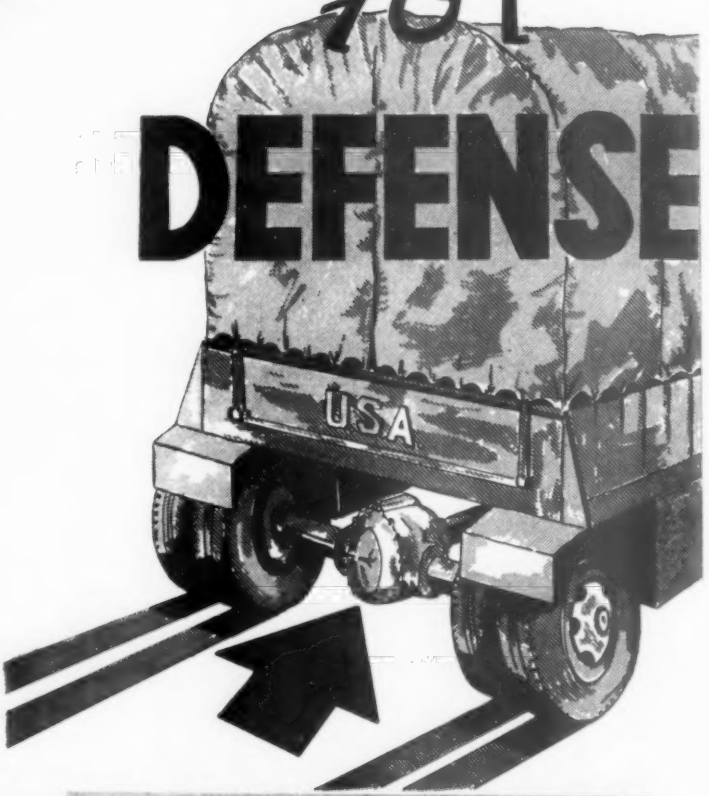
WRITE TODAY FOR FOLDER

DALZEN TOOL & MFG. CO.

12255 E. 8 Mile Road **Detroit, Mich.**

650% increase for DEFENSE



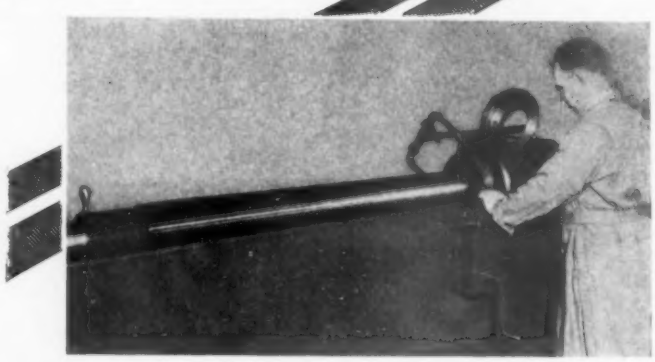


The AMERICAN Horizontal Hydraulic Broaching Machine shown above was furnished complete with tooling for broaching 46 involute gear teeth 1/4" deep through 1 5/8" length of steel bevel drive gears used in army truck differentials. The pitch diameter of gears broached is 6 9/16 inches.

Previous production of this part required 3 men and a battery of 9 special machines. The AMERICAN Broaching Machine now employed is a standard H-30-66 having 30 ton capacity and 66" stroke. It is equipped with outboard support and automatic broach support.

A single operator handles this AMERICAN machine and production of 15 pieces per hour is obtained.

This is a typical example of how AMERICAN has been able to break production bottle-necks in many instances in the manufacture of vital defense materials.



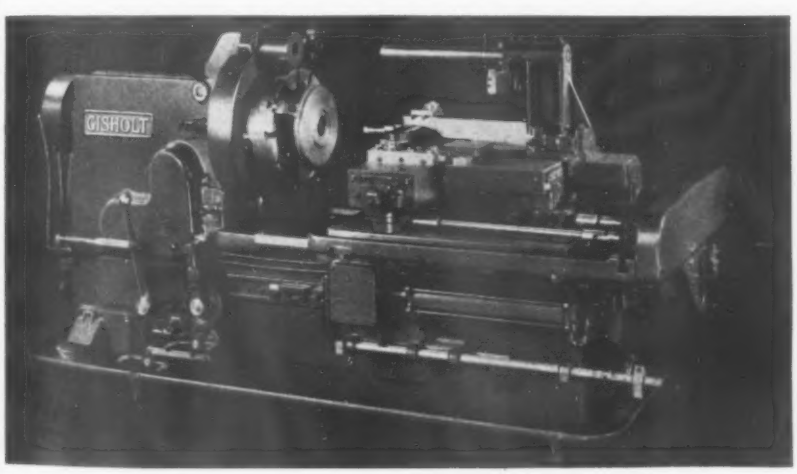
AMERICAN BROACH & MACHINE COMPANY
ANN ARBOR, MICHIGAN, U. S. A.
BROACHING MACHINES, PRESSES, BROACHING TOOLS, SPECIAL MACHINERY

Division of SUNDSTRAND MACHINE TOOL CO. ROCKFORD, ILLINOIS, U.S.A.

Work Conditioned"...

FOR TODAY'S RUSH PRODUCTION!

GISHOLT SIMPLIMATICS... Wherever they're in use today, the Simplimatics are bearing a lion's share of the burden. They're "work-conditioned" for the times!



The Gisholt Standard Simplimatic Lathe—33½" Swing, 18" to 28" Chucks.

Faster machining, within close limits of accuracy, is a primary reason for choosing Simplimatics. But equally important in most plants today, is the simple, automatic operation which eliminates the need for highly skilled hands to operate these machines. It makes man-power go further.

With extreme rigidity for multiple cuts, with automatic chucking, speeds and feeds, the Simplimatic is readily tooled to handle a wide variety of cylindrical parts. Production is so simplified that each operator can tend two or more machines.

If you have parts in large quantities, investigate the faster production and greater economies which Simplimatics make possible. Gisholt engineers can advise you.

Look ahead . . . keep ahead . . . with Gisholt improvements in metal turning

GISHOLT MACHINE COMPANY

1229 EAST WASHINGTON AVENUE • MADISON, WISCONSIN

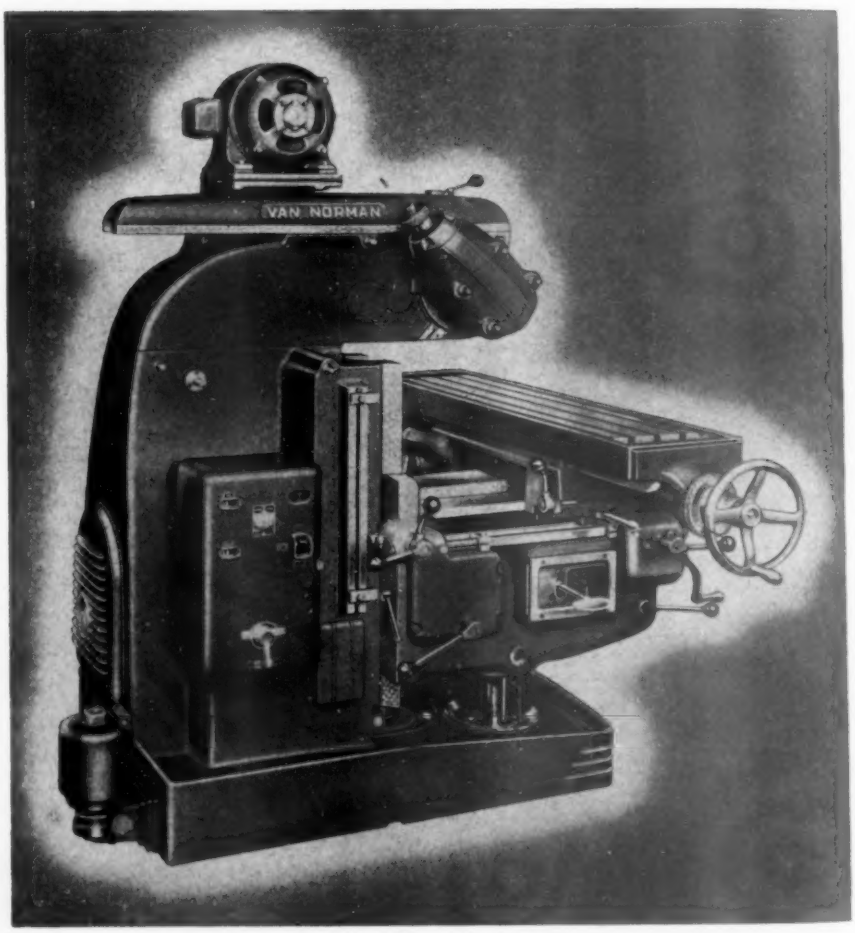
GISHOLT

TURRET LATHES • AUTOMATIC LATHES • BALANCING MACHINES

"I Don't Even TOUCH the Set-up"

New men, who are learning modern milling practice on Van Norman Ram-Type Universals, find that many mental hazards have been removed from the work by the designers of these machines. Instead of resetting the work, the operator quickly repositions the cutterhead at any angle from horizontal to vertical . . . even moves it to points outside its own range, with the sliding ram . . . takes the next cut, and proceeds in this way 'til the job is done. **All on the same original set-up.**

New men also find that Van Norman Universals are unexpectedly easy to operate and control. Levers that control power feeds and rapid traverse are conveniently grouped both at front and rear . . . are moved in the same direction in which operation is desired. Large dials give easy, accurate readings. This unmatched ease of operation swiftly develops confidence, which in turn develops skill and proficiency.



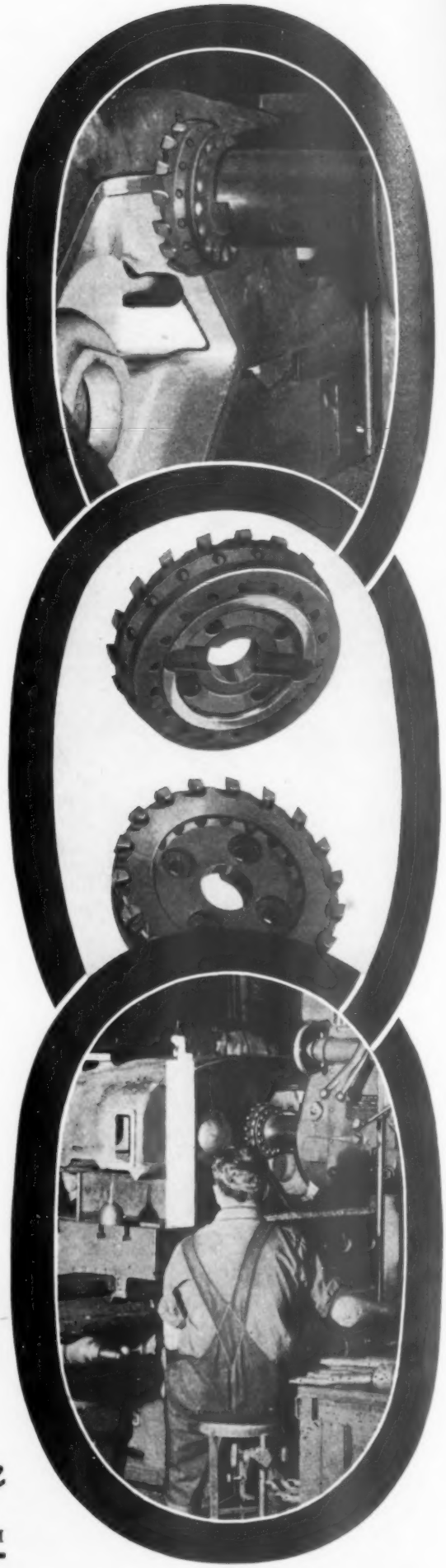
VAN NORMAN MACHINE TOOL CO.

Springfield, Massachusetts

A "Vital" LINK

in machine tool production

—LOVEJOY MILLS



In the job of multiplying the machine tool output of the Nation SIX TIMES during THREE YEARS (now probable of attainment) LOVEJOY Milling Cutters are taking a *basic* part. *Basic,* because the accuracy of machine tools now is *greater* instead of *less* in spite of this tremendous increase in production. This reflects the choice of tools used by machine tool makers — the reason that LOVEJOY Milling Cutters receive such wide acceptance in this field.

The precision and accuracy of milling machines depends to a large degree on the condition of the milling cutter. Why tie up expensive equipment with poor tools, or tools that require a lot of down time for sharpening or maintenance?

LOVEJOY Mills have quick changing interchangeable blades that are *positively locked* in the housing. Not only is down time reduced to a minimum — but the LOVEJOY design allows a maximum of the blade to be used before replacement becomes necessary. If you are not using LOVEJOY Mills it will pay to investigate. Just use the handy coupon.

LOVEJOY TOOL CO., INC., Springfield, Vt., U. S. A.

COUPON

Please send me a copy of the Lovejoy catalog on modern milling cutters ☐ Please send me a grinding chart so that I can get the most out of Lovejoy Milling Cutters ☐

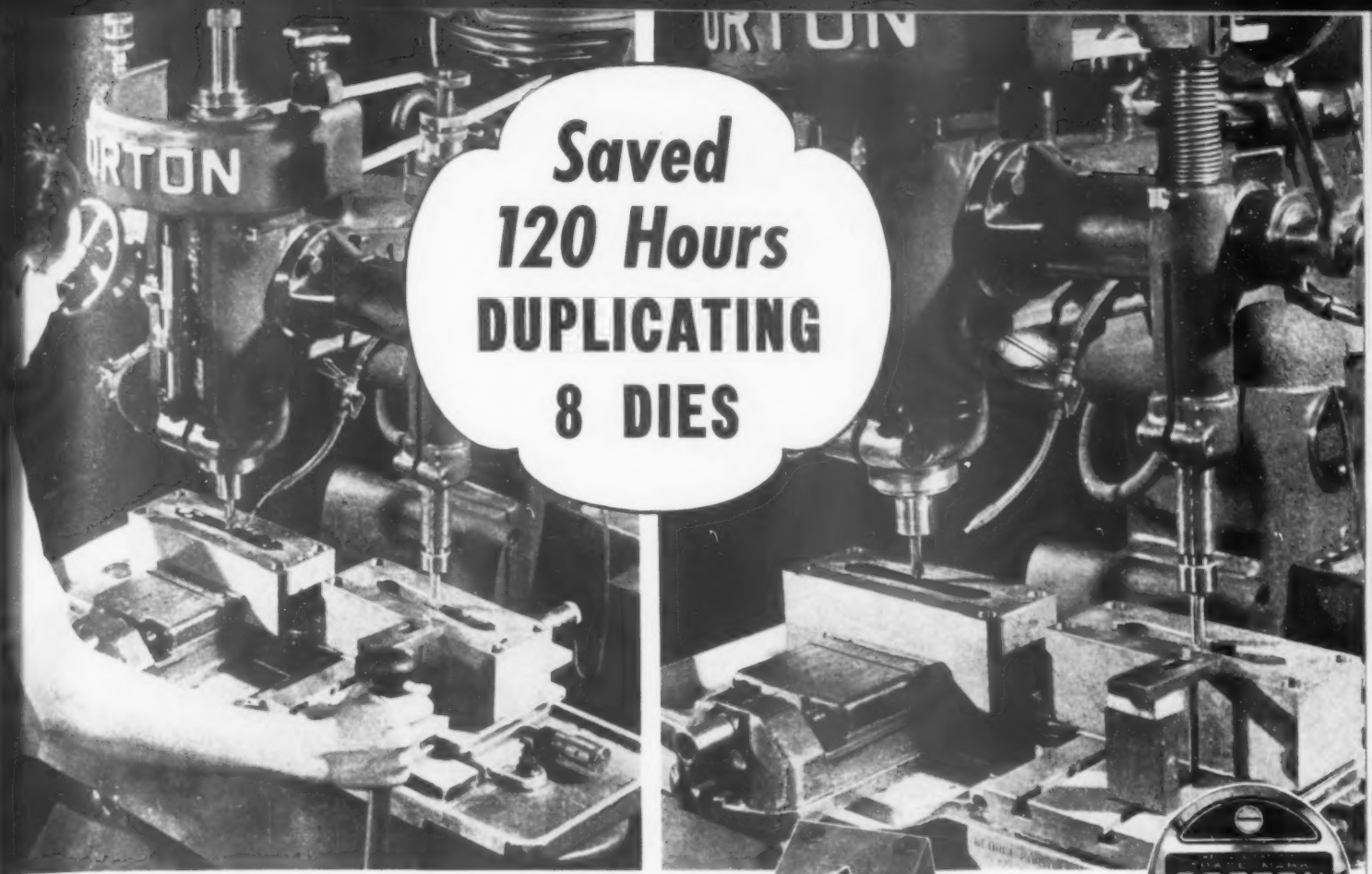
it's free

NAME_____ **TITLE**_____

COMPANY_____

STREET_____

CITY_____ **STATE**_____ **M**



Saved 120 Hours DUPLICATING 8 DIES

...Using a GORTON DUPLICATOR

EIGHT die molds are duplicated from the original master mold at the National Lock Co., Rockford, Ill.—a job that formerly took 40 hours per die—now done in 25 hours each.

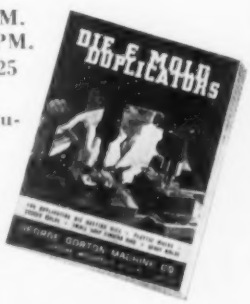
With the Gorton Duplicator these dies are duplicated to within a maintained accuracy of .001". Setups are simply and quickly made as shown. Micrometer adjustments are provided for adjusting the table holding the master die in both directions to align it with the work piece. A series of standard end mills are used for the roughing operations, and run at a speed of 500 RPM. Finishing cuts are taken by special ground cutters which run at a speed of 1100 RPM. Exceptionally smooth finishes are produced, which reduce polishing time to a minimum.

If you make dies or molds, or operate a tool room, it is possible that a Gorton Duplicator will step up production and save hours of time. Gorton Engineers are experts in the design and development of time-reducing die and mold duplicating equipment. You may consult them on your work for their advice and recommendations without obligation.

NOTE—To owners of GORTON Super-Speed Vertical Milling Machines built since 1935—order a Gorton Duplicating Tracer Head and Duplicating Table to quickly convert your Miller into a double-purpose machine, capable of duplicating parts and sinking dies, as well as milling.

SUPER-SPEED MILLING DATA

MACHINE—Gorton Super-Speed Vertical Milling Machine with Die Duplicating Attachment.
PART—Die Molds for Handles.
QUANTITY—8.
MATERIAL—Machine Steel.
CUTTERS—Standard End Mills—Special Ground Cutters.
OPERATION—Duplicate Milling Die Molds.
DIMENSIONS—7⅜" x 2¼" x 1⅜".
HOLDING—In a Simple Table Vise.
FEED—Hand Feed.
SPEED—Roughing—500 RPM. Finishing—1100 RPM.
FLOOR-TO-FLOOR TIME — 25 Hours Complete.
ACCURACY—Maintained Accuracy of .001" with Extra Fine Finish.



WRITE FOR FREE CATALOG 1319-D giving full details on Gorton Duplicating Equipment.

GEORGE GORTON MACHINE CO.

1322 RACINE STREET, RACINE, WISCONSIN, U.S.A.

SPECIALISTS IN ENGRAVING, DIE MAKING AND SUPER-SPEED VERTICAL MILLING

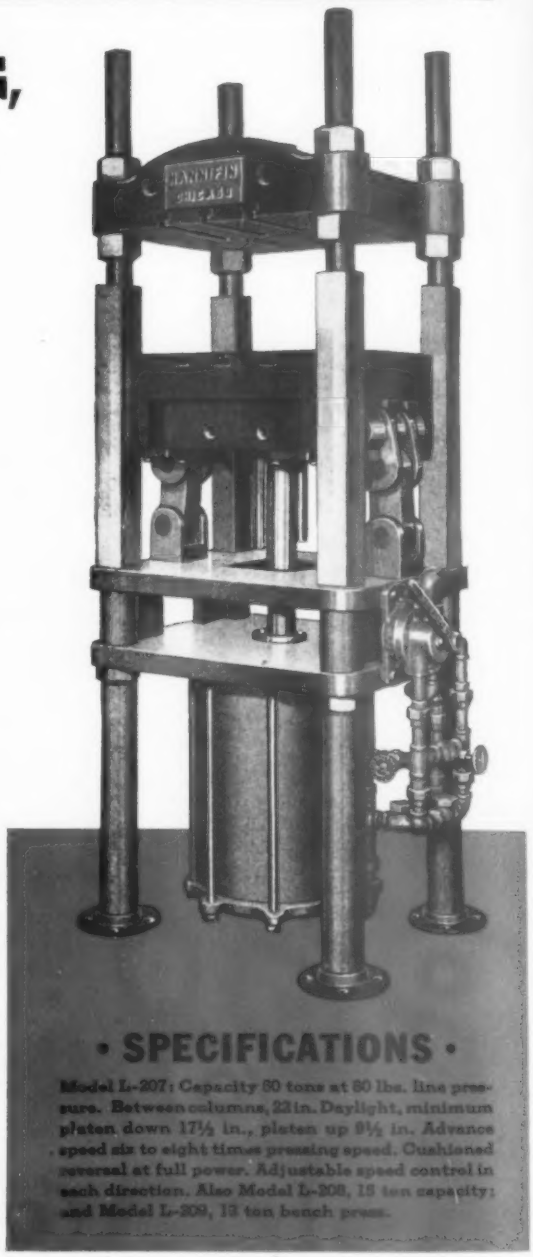
For Fast Production

ON A VARIETY OF MOLDING, PRESSING, AND PUNCHING OPERATIONS . . . .

This compact air operated platen press provides rapid operation and flexibility that allows it to be used for a variety of different types of work involving the application of pressure. Available in two sizes—15 ton and 50 ton capacity—this press is air operated and is compact and comparatively light in weight. The air supply at 80 to 100 lbs. pressure is already available in most plants.

Many industrial plants are using multiple unit installations of these presses for convenient, rapid handling of successive pressing, molding or forming operations, and for increased production capacity without excessive investment. One operator efficiently handles as many as five presses on many types of work.

The exclusive design of this air operated press provides a fast operating cycle that saves time on production operations. The rapid advance stroke is followed by a short power stroke at full pressure, and full power is available on the return stroke, to open molds. Speeds in either direction may be regulated to suit individual needs. These platen presses are being used for a variety of work, including steel rule punching or blanking, multiple pressing operations, rubber and plastic molding, perforating, and forming. Hannifin engineers will gladly give you specific recommendations on the application of this equipment to your work.



• SPECIFICATIONS •

Model L-207: Capacity 50 tons at 80 lbs. line pressure. Between columns, 22 in. Daylight, minimum platen down 17½ in., platen up 9½ in. Advance speed six to eight times pressing speed. Cushioned reversal at full power. Adjustable speed control in each direction. Also Model L-208, 15 ton capacity; and Model L-209, 12 ton bench press.

Prompt Delivery

A limited number of both 15 ton and 50 ton presses of this type are available for immediate shipment.

HANNIFIN MANUFACTURING COMPANY
621-631 South Kolmar Avenue **Chicago, Illinois**

Detroit Representative: R. A. BEAN
Hayward Building, 4829 Woodward Avenue Telephone Columbia 4949

HANNIFIN *air operated* PLATEN PRESS

THE TOOL ENGINEER

T.M. Reg. U.S. Pat. Office

Volume XI, Number 4

Industrial Standards—and Speed!

DURING its comparatively brief existence, the automotive industry has consistently improved its product. Where, in the early days, a car needed an overhauling every 5000 miles or less, with frequent renewal of parts, a user may now expect upward of 100,000 miles of dependable service with only an occasional checking up.

More, the automotive industry set up standards of perfection not previously approached, established interchangeability and demanded—and got!—a precision that completely revolutionized gaging and inspection, and established rigid specifications of materials. With high quality was combined speed of manufacture; paradoxically, the greater the demand, the more extreme the accuracy and the choicer the refinement of design and materials.

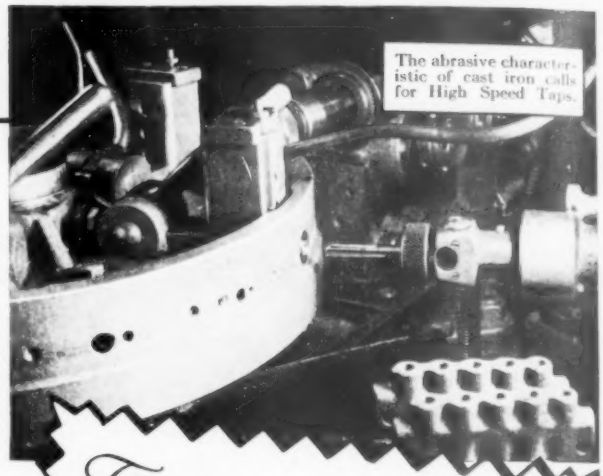
Now, if industry could do this with peacetime products, and in time of peace, it is a foregone conclusion that it will as honestly and consistently meet the demands of wartime production *if given the chance*. This is not conjecture, rather, it is a known fact that major industry has anticipated wartime demand and reared huge plants on only a casual promise of Government contracts. And, as far as plant and equipment is suited to the job, all American industry is now prepared to deliver the goods within the limitations of engineering ingenuity and commercial standards of quality and speed.

And right there is the marrow of the bone of contention—*the limitations of . . . . . commercial standards of equality and speed*. We've just got to have both quality and speed, but the latter can be sacrificed to a demand for quality beyond the present limitations of commercial possibility. And we haven't time for protracted experiment, rather, must make the best of known processes. Fortunately, these seem to be somewhat in advance of the best so far evolved by the enemy, who has largely copied our own inventions and turned them against us.

As a pat example, we are making major changes in mobile armored units, changing from riveted to welded construction. In this connection, there are three practical processes for welding armor plate:—hand welding, which is slow and requires a chipping operation between each bead; machine welding, which is considerably faster, and a recent development which, as far as speed is concerned, transcends anything previously known. It may be assumed that any of the three would produce a stronger unit than one which is riveted, but only the latter method would compare favorably with the speed of riveting. Yet, while it meets all requirements for commercial production, it has not, apparently, satisfied the extreme demands of the Army.

Yet, from what is at once the narrower field of civilian perspective and the broader vista of Tool Engineering, we would say that a method which affords both a quality superior to previous modes of processing and which also promotes speed in manufacture should be accepted at its present stage of development. We cannot, successfully, contend against an intensively prepared enemy if we are to engage in long drawn experiments or if we set up standards of perfection which can only be attained at a sacrifice of essential speed. We can, however, achieve Victory with the machinery of war rolling off the assembly lines. *Let's roll 'em along!*

WHICH TAP SHALL I USE... HIGH SPEED or CARBON ?



Just as in any other cutting operation, the right tool for the job to be done will guarantee best results. Here are a few hints that may help you in determining what type of tap best fits your needs:

1. Cost of Tap vs. Cost per Tapped Hole

Carbon Steel Taps cost less than High Speed Taps. If you can get equal results as to quality of thread from either type, then by all means use Carbon Taps.

Even though the quality of threads produced is equal, however, you may find that High Speed Taps will tap more holes at less cost per hole.

2. Operating Conditions

Ordinarily, High Speed Steel Taps must be run at higher speeds than Carbon Steel Taps, usually 2 to 2½ times as fast. If your tapping machines or screw machines haven't the speed necessary for efficient operation of High Speed Taps, the use of carbon taps may be advisable.

Consult a cutting speed table covering suggested speeds for various tap sizes and materials.

3. Material Being Tapped

The physical properties of the material being tapped will, many times, leave you no choice as to type of tap to use; some materials *require* the use of High Speed Taps while others may be tapped equally well or even better with Carbon Taps. For example, Carbon Steel Taps are efficient in brass and ferrous metals while most non-ferrous metals and abrasive materials, such as bakelite, fiber, hard rubber, etc., quickly turn cutting edges and indicate the use of High Speed Taps.

4. Results Required

Precision Threading, requiring the close tolerances obtainable only with Ground Thread Taps, will ordinarily dictate the use of High Speed Taps, since only High Speed Taps are regularly furnished with Ground Threads.

There is a tendency today to use High Speed Steel Cut Thread Taps when Carbon Steel Taps would serve the purpose just as well. Check your tapping jobs to be sure that you are using the correct type of tap for each.

Similarly, don't specify GROUND THREAD Taps if CUT THREAD Taps will do.

This is one of a series of advertisements published by Greenfield Tap and Die Corporation to help users get greater production from their small tools in these critical times, through making useful facts more widely known

GREENFIELD TAP AND DIE CORPORATION
GREENFIELD • MASSACHUSETTS
DETROIT PLANT: 2102 West Fort St.
WAREHOUSES in New York, Chicago and Los Angeles
In Canada:
GREENFIELD TAP AND DIE CORP. OF CANADA, LTD., GALT, ONTARIO

GTD GREENFIELD

TAPS · DIES · GAGES · TWIST DRILLS · REAMERS · SCREW PLATES · PIPE TOOLS

Tooling—*the world's largest* Bomber Plant

On a windy day in March, a crow balanced on a barbed wire fence, moodily surveyed 975 acres of fertile southeastern Michigan farmland. In one year, his empire of corn fields and woods had disappeared. While a snarling sawmill ate its way through trees in which he had nested, the largest aircraft plant in the world neared completion at Willow Run. In the building's finished sections, America's Henry Ford had started to mass produce bombers.

Tool Engineers spend more than 7,000,000 man-hours in 90 shops, speeding to mass produce a sky giant

By JEROME S. WILFORD

MARCH 28, 1941, Henry Ford began construction of the world's largest plant, under one roof, to produce 30 ton bombing planes. With more than 2,000,000 square feet of floor space, the Willow Run plant is expected eventually to employ between 75,000 and 100,000 men and women. To operate their share of the more than 40,000 machine tools with which this industrial battlefield will be equipped, thousands of these workers must be newly trained.

The Ford Bomber plant, a four corners of America at war, is still part red steel, girding its loins to carry the burden of brick, glass, machinery and gargantuan cranes. It is ploughed, scarred earth, concrete footings; surveyors marking off new roads to lead to it. It is so immense that some of the men who are building it, ride on bicycles from one unfinished section to another. It has in its mind the longest assembly line in the world.

At the finished end of that line, wing and fuselage sections are already being produced.

Ford Converted 15%

Men who know "sequence of operations" are pushing 24-hours a day to get this giant in full swing. They are too busy to tell a reporter what they have spent a year doing. Their every minute must now be invested to insure that the more than 7,000,000 man-hours already spent on tooling have not been wasted.

But they mention an incident, an isolated operation. Talking briefly to this man and that, the threads of the story can be picked up,—some conception of the job of putting airplanes on mass production can be patched together.

Airplanes on mass production — that's a job no one here ever tackled until Henry Ford said he would do it. His decision has resulted in some startling applications and discoveries of what men can conceive with machines and materials when the pressure of a battle against time hangs over their heads.

Of course, when lay people hear that an auto manufacturer is spending millions of man-hours to tool a bomber plant, they generally want to know what equipment will be taken over from auto production. On the Ford job, about 15% of the machine tools installed in the Rouge Plant were applicable—and little short of genius could have made some of them do the jobs they are doing today.

The other 85% of the tools had to be newly designed. The total machine tools will produce more than 25,000 parts for each bomber.

Twenty-Four Hours to Answer

Conversion of men, however, was just about 100%. A lot of redesigning had to be done on their thinking processes. As a Ford Tool Engineer stated, "A lot we knew about automobiles just got in our way."

In the beginning, 200 Ford engineers, production men, designers and draftsmen went to a western bomber plant to inspect the plane they considered building. When the people who had constructed a few planes a month asked them to put the job on production, Ford men asked for 24-hours to estimate the possibilities. They crawled all over the plane. They made drawings, talked, sketched on tablecloths during hasty meals, added up figures. Twenty-four hours later they said "yes."

An army of Ford draftsmen was stationed at the western plant, and a bomber was sent to Dearborn. While the draftsmen worked beneath the eyes of the plane manufacturer, Tool Engineers at the Ford plant tackled the production problem. And while all this was going on, the crow at Willow Run was wondering what the heck kind of a crop was being planted in the fields.

The engineers that crawled over and through the plane at Dearborn learned construction from nose to fuselage, bumped their heads against the bulkheads, scratched their knees and elbows in the wings. (A small boy who could squeeze into the wing tips to measure parts was a Godsend.)

Tearing a Bomber Apart

Then they started to take the plane apart. They took a piece off and started a man designing a tool to build it. Or they took two pieces off and said build a tool that will make both of these at once. And as fast as they could tear the plane down, they

Looking down the main aisleway in the Ford Tool and Die Shop, one of the largest in the world. Battery of 20 Keller Duplicators can be seen in the center. Part of the problem of deep-drawing aluminum with hard dies was solved here.

put someone to work, and when they had the plane all apart, sketches and blue prints were already coming off the acres of drawing boards.

Ford Tool Engineers became akin to the huge weapon, like an infantryman becomes akin to his gun after fifty times sitting on his barracks cot cleaning it. Like the soldier, they could take their weapon apart and put it together again, in the dark.

Ninety Tool Rooms

As fast as designs were finished and approved, the prints went to the pattern shops and the tool rooms. Thirty Ford tool rooms and sixty outside shops were geared to the task of equipping the Willow Run plant. Contracting for the work was on a straight time and material basis.

Today, many of these tools are at work, either at Willow Run, if space for them has been made ready, or scattered around in Ford shops wherever room could be found.

The bomber plant's own tool room, occupying more than 40,000 square feet, is almost completely outfitted. Tool Engineers from the Rouge plant are either utilizing this equipment or teaching others to use it.

Ford Built Fixtures

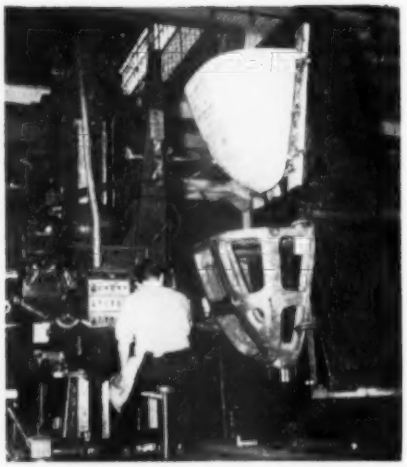
Sections of the parts manufacturing departments are at work, with both hydraulic and mechanical presses. Willow Run will not only manufacture its own parts but will supply two other final assembly plants.

In much of the section which will house the world's longest assembly line, hundreds of giant fixtures, built in the Ford shops, and the automatic tools furnished by outside suppliers have been placed in operation. Far down that vast channel through which sub-assemblies will funnel into the final assembly line, a bulkhead marks the end of the finished building. Week by week, this temporary wall is moved on the heels of the construction workers.

A detailed picture of the plant today and what it will be tomorrow can, of course, not be printed. For that matter, however, such a picture would be difficult to obtain at this stage of operations. But, there are odds and ends of information which can give the Tool Engineer an idea of how Ford has attacked the problem of mass-production on the bombing plane. They indicate the revolu-

Carlton radial drill boring spring pad for deep-draw aluminum dies. Numerous combinations of holes allow location of various sized die-sets. Big presses are thus not tied up with single part-time jobs.

Above—Testing hard dies for deep-drawing aluminum. Dies shown on this Clearing press produced a section of the bomber's enclosure, shown standing against the press. Below—Ford tool room employes finishing one of the hard dies in the big Ford Tool and Die Shop.



Profiling hard die for deep-drawing aluminum, using plaster model, on one of Ford shop's 20 Keller Duplicators.

tionary changes in plane production which are taking place, and when it is stated that these are not exceptions to the picture as a whole, the Tool Engineer can well imagine how in this field his horizons have extended.

A good example of what has been done is illustrated in the treatment of aluminum. Though Ford engineers who found that what they knew about automobiles just got in the way, learned much from aircraft engineers, they did not allow themselves on the other hand to be overly hampered by some of the pre-conceived notions of the aircraft people. One such notion was that aluminum could not be deep-drawn with hard dies. Ford men, hearkening back to the days when steel sheets could not be deep-drawn, decided to look into the matter.

Deep-drawing Aluminum

The first obstacle met in deep-drawing aluminum is that its elastic limit is considerably lower than that of most steels. Ford engineers found that the aluminum alloy with which they must work would stretch slightly. Their press shops had drawn steel for automobile bodies which stretched 35%. However, this fact was only something to reckon with. It was not an insurmountable barrier.

A distinct barrier however, might be lack of standard quality. This was one of the drawbacks in the early days of deep-drawing steel. So Ford engineers went to the Aluminum Company to study this phase of the problem. Just as had been the case with steel, there was enough variation in aluminum sheet to prevent deep-drawing with hard dies, though not enough to prevent the use of "soft" dies, where several re-strikes are performed on a sheet covered with progressively thinner rubber pads.

The co-operation of the Aluminum Company in obtaining more finite standardization of aluminum sheet for deep-draws removed a real obstacle. The rest was up to the plant engineers.

Testing Dies

The benefit in man-hour savings well repaid the effort and represented a vital step in attainment of true mass-production. On forming the pilots enclosure, which roughly forms a quadrant, two equal-sized panels are drawn. Previously, several panels were necessary.

Though still considered in the experimental stage by Ford, an inexpensive soft alloy may be used on blanking dies. Sheared into a 5/32" layer of plough steel mounted on the die-set, this metal seems to have and to preserve a sufficient hardness for cutting aluminum. In making soft blanking dies, considerably less wear is experienced on the cutting tools.

As far as the drawing dies are concerned, regular dies steel or 4-A Vanadium steel is generally used. A small percentage have been produced from cast iron. At times, all of the Ford shop's 20 Keller Duplicators have been engaged profiling from plaster casts for these aluminum dies.

In testing dies for aluminum, steel is drawn first. If it does not work, aluminum won't. The job of correcting the dies is simpler, if the defects which show up with drawing steel are corrected first. After steel can be successfully drawn, any defects in drawing aluminum are known to be confined to the peculiarities of this metal.

The Ford Motor Company, which pioneered centrifugal steel-casting in the automotive field, has applied its experience to the aircraft field, with resultant saving of time, material and tools. The Ford centrifugal casting development has been successfully used in producing the landing gear hinge on the bombing plane. Formerly made in nine parts, with 126 inches of welding, this vital part is centrifugally cast in one piece — saving time, tools and three pounds of metal. The hinge tested to carry twice the design load.

Another instance of metal saving is found in the greater use of welding of aluminum, where sufficient support is afforded by rivets or structure. Ford engineers estimate a saving of one third of the rivets formerly used.

What Constitutes a Part

Given a standard plane design, Ford assembly wizards have made time-saving strides in putting the bomber on mass production. The secret—though it lies more in ability than anything—is in deciding within what range of the assembly operations certain parts must be machined, finished and joined to other parts. And it goes back of that to deciding what constitutes a part. Sometimes a Ford part may previously have been several parts on earlier opera-

In this scene at the Ford Bomber plant, riveters are assembling the skin on the upper surface on the plane's outer wing skeleton.

Ford tool and die shop employes assembling the mammoth fixture which holds the bombing plane's more than 50-foot wing center for final milling and finishing operation. In excess of 60 tools work simultaneously on the wing center after it is in fixture.

tions — as with the landing gear hinge. Or, it may be one of several pieces which were all in one part at one time.

An illustration of the latter case was the assembly of the planes' nerve system — pipes, tubing, conduits. Ford bends these in bundles over templates which conform to the channels they follow in certain sections of the fuselage or wings. These bundles are assembled with those sections of the fuselage. In the mating bucks, complementary tubing or pipes are joined together to complete the nerve system. Previous assembly sequences called for stringing tube and pipes through a much more complete plane.

Wing Center Fixture

One of the most amazing features in the bomber sub-assembly is the giant Ford-built fixture which holds the completely fabricated wing center for final machining and finishing.

More than 60 tools, working at various angles simultaneously machine and finish this piece for final assembly. Holes are drilled and surfaces milled for assembly of four motor mounts and motor cowls, the landing gear, outer wing bolts and fuselage bulkhead stub channels. Operators on stationary scaffolds perform a minimum of tasks, such as adjusting toggle clamps and locating the swivelled milling heads which must be held clear while the wing center is lowered into the fixture.

Milling heads that machine the pads for the fuselage bulkhead stub channels perform an interesting automatic operation, moving across the leading and tailing edges on one path and returning on another.

Surveyors Are No Longer Needed in Assembly

Fixtures previously used on this pre-final assembly operation had to be partially dismantled for placement and removal of the work piece. Though they were located in the fixture by a surveyor, there was generally not sufficient provision to permit interchangeability, a requisite and an important benefit of mass production. Not only will mass production furnish more planes, but it will furnish wings and then parts to quickly repair damaged planes—thus strengthening America's air arms tremendously.

Riveting the Skin to the Outer Wing

Riveting the skin to the outer wing skeleton is performed on a fixture not dissimilar to the typical automatic barbecue spit. The skeleton, suspended on a horizontal axis, turns before the workers, enabling them to attach the skin and maintain a comfortable position. Such construction with regard to working position has been a prime factor in fixture design.

The Ford bomber plant — tools, building, workers — is much like the winged giant it will produce. Work is being done on everything at once. Something has been told of the building. Without going into detail, it is worth noting that further construction will give this plant the largest hangar ever built. It will serve the large airport.

Other construction includes erection of a modern industrial school, an extension of the present Ford schooling system. Here important instruction is afforded Ford workers. As many as 7,500 or 8,000 students, men and women, are expected in the initial enrollment. Right now, about 3,000 students are being trained in the plant proper. Classroom space in one of the plant balconies is in use 24 hours a day. Incidentally, Ford instructors found their first women students "know their stuff." Early enrollees included a rural school teacher, a copy writer from an advertising agency, a saleslady and an aviatrix. Compared to men, who thought they knew a lot about bomber construction because they had read a few magazine stories, the girls proved to be better students—asking more questions, taking more notes and demanding more technical instruction. Complete plant operation is expected to use from 12,000 to 20,000 women.

Yes, work is being done on everything at once—tools, building, workers. One morning Willow Run will hatch a bomber, then another and another (production figures can't be given). Bombing planes will stream from its assembly line, will circle the nest, try their wings and fly to battle.

Ford Bomber Plant Shows American "Know How"

Not mass production or mass construction alone, is the secret of the tremendous industrial effort America is expending, but the "know how." That American "know how" is now tooling tremendous plants to supply bigger weapons in ever greater quantities to carry this war to the enemy.

Measurements of External and Internal Helical Involute Gears

A simplified method for calculating proper dimensions where accuracy is vital

By H. PELPHREY, *Michigan Tool Company, Detroit*

SINCE the accuracy to which gears, involute splines, etc., are produced has a vital effect on the performance of ordnance, airplane engines and many other products needed for war purposes, methods whereby accuracy can be checked in production are more important than ever before. One of the means frequently used is the so-called "Ball Measurement Method".

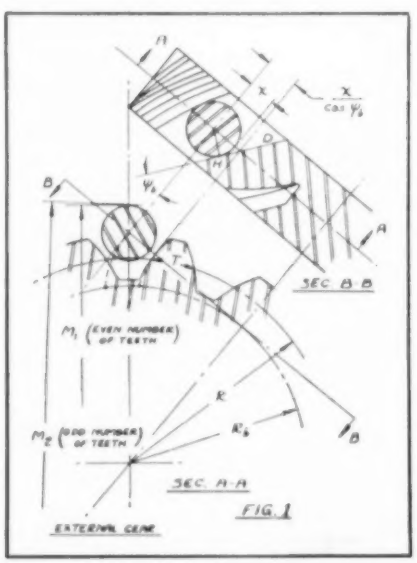


FIG. 1

In using this method, one application is to utilize ball tipped micrometers with a guide piece attached to one side. The guide is held against one side of the gear so that both ball tips will be in a plane at right angles to the gear axis. Another is that developed by Sam Trimbath of the Fuller Manufacturing Company, wherein balls made with a steel plate attached and hinged as an alignment medium are used. Short sections of accurately ground steel rod also are used for spur gears or splines.

The following formulae and drawings show a simplified method of calculating proper dimensions for both external and internal gears of helical involute type. The formulae utilize the standard symbols of the American Gear Manufacturers Association for easy reference.

Figure 1 illustrates two diagrammatic sections of a helical gear and ball. Section A-A is a plane taken at right angle to the axis of a gear and passing through the center of the ball. Section B-B is a plane tangent to the base diameter and passing through the center of the ball and at right angle to the first plane.

R = GIVEN RADIUS
R_b = BASE RADIUS
T = ARC TOOTH THICKNESS IN ROTATING PLANE AT R
ϕ_1 = PRESSURE ANGLE IN ROTATING PLANE AT R
ϕ_2 = PRESSURE ANGLE IN ROTATING PLANE AT CENTER OF BALL
ψ = HELIX ANGLE AT R
ψ_b = BASE HELIX ANGLE
X = RADIUS OF BALL
N = NUMBER OF TEETH IN GEAR
M_1 = MEASUREMENT OVER TWO BALLS FOR EVEN NUMBER OF TEETH (BETWEEN FOR INTERNAL)
M_2 = MEASUREMENT OVER TWO BALLS FOR ODD NUMBER OF TEETH (BETWEEN FOR INTERNAL)

(1) $2R_b = 2R\cos\phi_1$

(2) $\tan\psi_b = \cos\phi_1 \tan\psi$

FOR EXTERNAL GEARS

(3) $\text{inv}\,\phi_2 = \frac{T}{2R} + \frac{2X}{\cos\psi_b 2R_b} + \text{inv}\,\phi_1 - \frac{\pi}{N}$

(4) $M_1 = \frac{2R_b}{\cos\phi_2} + 2X$

(5) $M_2 = \left(X + \frac{R_b \cos\frac{90°}{N}}{\cos\phi_2}\right)2$

FOR INTERNAL GEARS

(6) $\text{inv}\,\phi_2 = \frac{\pi}{N} + \text{inv}\,\phi_1 - \frac{T}{2R} - \frac{2X}{\cos\psi_b 2R_b}$

(7) $M_1 = \frac{2R_b}{\cos\phi_2} - 2X$

(8) $M_2 = \left(\frac{R_b \cos\frac{90°}{N}}{\cos\phi_2} - X\right)2$

side of tooth "D" is a straight line and is disposed along the base helix angle. As all the involute calculations are in plane A-A, it is obvious that "X" should be divided by the cosine of the base helix angle to obtain the relative position of the ball in the same plane.

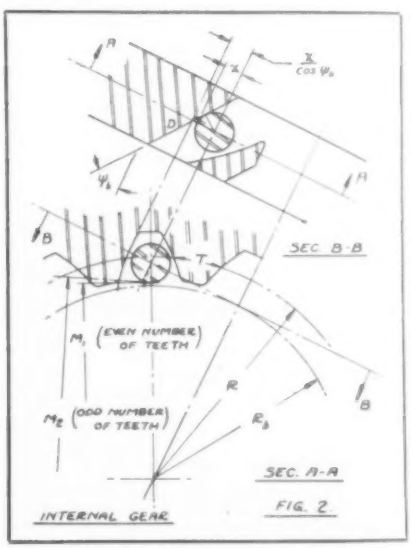


FIG. 2

As will be noticed, here stated equation (3) is exactly the same as Professor Buckingham's well-known equation for spur gears except that the second expression is divided by the cosine of the base helix angle which is explained diagrammatically in Figure 1.

The symbol "T" for the internal equation designates the circular tooth thickness in the plane of rotation of the metal portion (not the space), as illustrated by Figure 2.

St. Louis Convention

Celebrates Decade of A. S. T. E. Progress

By A. E. Rylander

ROLL up your sleeves, folks, and spread your napkins, because this yarn is going to be served country style; no high falutin' trimmings. There just ain't time for anything but flash impressions from a viewpoint of personal observation.

Going down, had the pleasure of taking Geo. Whitehouse, Charley Lau, Harry Cowan and Jim Ellsworth for a ride on the Wabash and would have taken Joe Siegel only he had the Missus along and had to retire before the last pot. I'm like the English, win the final battle. Thanks, fellows, and many happy returns.

Up betimes, as Sam Pepys would have put in, and viewed the scenery. Spring stealing a March on the north, acacias flaunting their golden plumage, greening trees. Ol' Man River, rolling along; arrival! First time in St. Louis since '11, and improvements and modernization conspicuous by contrast. Fine street cars, streamlined, quiet, fast, years ahead of the flat wheel rattlers touted by Detroit transport tycoons as the country's finest transportation system. St. Louis, a fine town and we owned for the duration, returned it as good as found.

Registration desk at the Jefferson a beehive of activity as the Tool Engineers poured in. Greetings and handshakes, joshing and friendly insults; rump sessions as the Directors deployed for action. The Directors' meeting, starting early and winding up around midnight. My first for these many moons (I proxied for Roy Bramson, New Chapters) but felt very much at home. The same old stuff; propose and debate, move and support, each Director fighting for his section but each subordinating local issues to the general good of the order. Adrian Potter, Yank from Springfield, Mass., elected Exec. Secy. to succeed the late Ford Lamb. Otto Winter elected Prex, Ray Morris stepped up to 1st V. P., Doug Burnside, St. Louis Ch'man in charge of the Convention, elected 2nd V.P. Fine boy, Doug; runs to longitude. Clyde Hause reelected Nat'l. Secy. and Frank Crone continuing as our Mr. Morgenthau. Among those present, Howard Handyside, A.S.T.E. office manager. Quiet, assured and efficient, Howard has developed plenty from the responsibilities assumed since the demise of the dynamic Ford Lamb.

New faces among the old; had to get acquainted gradually but got around to first names after a while. The old A.S.T.E. good fellowship. Study in contrasts to watch the boys in action; veterans assured, at ease, first termers feeling their way. Peck's Bad Boy Connie Hersam, getting Prexy's goat but there with the apples regardless; matured Irwin Holland, genial Ed Dickett and grave Earl Johnson, bland but discerning John Lindegren and Two Gun but square shooter Geo. Keller; "be sure you're right" P. W. Brown and "Show Me" Clete Briner; methodical Gene Bouton and smiling but shrewd King Cole. The deaconly Mr. Sprott from Nashville and "Tall in the Saddle" Collins from Houston; serious Jack Marvin from the Coast, to mention names at random.

Long, long pow-wow over Constitution and By-laws, with Atty. Gen. Bob Lippard on the receiving end. Bob finished the last round without a hair out of place, having let his inquisitors wear themselves down. Oh, rawther. Highlight of the meeting was the invitation to Annual in Milwaukee, Bill Iekel selling the City-that-made-beer-famous with all the suave aplomb of a veteran convention super salesman. And to think, the guy's just a Tool Engineer like the rest of us. (Note to his boss:—the boy's got something; push him along—or rather, don't apply the brakes. He'll go places). Springfield, Mass., got the Semi-Annual in October. Ed. Berry from Providence No. 53; knew we'd get Little Rhody eventually. Visiting celebrity E. V. Larson from Canada, Assistant Deputy Machine Tools Controller. Committee reports, recesses for lunch and dinner, and, as aforesaid, wound up around midnight. Then, a bit o' diversion and early(?) to bed.

Technical sessions unusually well attended. Didn't get a chance to sit in myself, but peeked wistfully in when

(Continued on page 68)

Technical Sessions

"Conversion from Peace Time to War Time Production" dealt with a matter of vital moment to those converting plants from known to untried manufacture. Both Clif Ives and Hugh Weed, Vice Pres. of Carter Carburetor Co., St. Louis, treated the subject ably and, with W. T. Powell, St. Louis, who presided, answered questions pertinent to plant conversion.

"Substitutions and Shortages of Materials" had Clarence Miller of the Measureograph Co. presiding. Dr. D. R. Kellog, Westinghouse Electric & Manufacturing Company, made a real contribution in his treatment of this problem.

Since the making of tools and their use in mass production imposes problems of inspection, it was natural that Wm. Scheer, Pres. of the William H. Scheer Company, St. Louis, should preside over "Problems Relating to Defense Inspection." He has made a lifetime study of gaging and inspection methods. Here, too, the Army was vitally concerned, and Col. Roswell E. Hardy, Dep. Chief of the St. Louis Ordnance District, spoke for the Brass Hats. F. E. Allison, Chief Inspector of Wagner Electric Company, dealt especially with government specifications, often confusing to the civilian manufacturer.

"Cutting Tool Conservation", Ernest Clark, President of Clark Equipment Co., presiding, drew more than ordinary interest because of the acute shortage of high speed steels. Speakers A. H. d'Arcambal of Pratt & Whitney, and L. W. Lang of National Tool Salvage Company spoke from the standpoint of industrial authority. Prof. O. W. Boston of University of Michigan, a widely known contributor to the science of metal processing, discussed cutting fluids.

"Aircraft Mass Production" was presided over by E. A. Doogan, Chief Tool Designer for Curtis-Wright, St. Louis plant. While Brig. Gen. Wolf of the Army Air Corps commanded attention because of his contribution to aviation, the movies seemed to have been the center of interest, perhaps because they told a poignant story in pictures. H. E. Linsley, of the Wright Aeronautical Corp., Paterson, used them to punctuate his remarks.

Everything considered, the technical sessions were a vital part of the Convention. They will be discussed further in future issues of The Tool Engineer.

CAMERA HIGHLIGHTS

H. E. Linsley of the Wright Aeronautical Corporation, Paterson, N. J., left, above, and L. A. Garland of St. Louis, talk things over at the registration desk. Mr. Linsley spoke at Saturday's technical session.

The cameraman snapped A. E. Feightner of Lima, Ohio, left, above, and W. B. McClellan from Detroit at the right who made up one of many small discussion groups following the session Friday on cutting tool conservation.

New Executive Secretary of the A.S.T.E., A. L. Potter, right above, and A. E. "Handy Andy" Tylander. Below—Arthur J. Denis, left, Beverly Hills, and R. E. Garwood, Los Angeles, asked for a western meeting for next March

Above—Crowds of A.S.T.E.'ers jammed around the registration desk. Here the obliging gals not only would tell you if your friend from Peoria was at the convention, but also start you on plant trips and take your reservations for the banquet. Inset—Youngest A.S.T.E.'er was Charley Bunnell Jr., who came from Detroit with his parents, Mr. and Mrs. C. E. Bunnell.

On Friday afternoon, National Officers broadcast over Station KMOX. In the picture at the right, Frank Curtis, outgoing president of the Society, speaks into the "mike". Just back of him is Otto Winter, incoming president, waiting his turn to speak on the air.

Army and Navy uniforms were aplenty at the speaker's table. At the left, left to right, Lt. B. M. Powell, Great Lakes Naval Station; Commander W. F. Veatch, St. Louis Navy Arsenal; and Prof. O. W. Boston of the University of Michigan.

Newly elected officers were inducted into office at the banquet Friday evening by A. H. d'Arcambal, a past president of A.S.T.E. In the picture above, the new officers facing Mr. d'Arcambal are, left to right, Otto W. Winter, president; Ray H. Morris, first vice-president (back of d'Arcambal thus shown in inset); D. D. Burnside, second vice-president; Frank R. Crone, treasurer; and Clyde L. Hause, secretary. One of many banquet highlights.

Plant trips were popular with buses filled on every tour. A.S.T.E. members attending the annual convention in St. Louis saw the work going on in the plants of the Emerson Electric Company and Carter Carburetor Corp.

For two years in a row now, Detroit has received the cup awarded to the chapter with the greatest increase in membership for that year. Above—Frank Curtis presents the gold cup to Clyde Mooney, Detroit.

TOOL ENGINEERING

ASTE

KEY TO VICTORY

Above—Energetic, enthusiastic Dr. Charles Copeland Smith, main speaker at the banquet, whose subject was, "Engineering for Victory". Right—Rear Admiral Downs came all the way from Great Lakes Naval Station to address Tool Engineers at their banquet. Below, D. D. Burnside, General Chairman of the annual meeting and A.S.T.E.'s new second vice-president, was applauded for a successful meeting.

Above—E. V. Larson, Assistant Deputy Machine Tools Controller of Canada attends director's session. Below—Officials of government and industry made the technical sessions an important part of the convention.

Above—Bill Iekel's hospitable invitation to the A.S.T.E. directors to have the '43 March meeting in the city of Milwaukee was accepted.

The Convention in Retrospect
Handy Andy's Yarn—Country Style

occasion permitted. Clif Ives, Milwaukee War Production Board, went over big; no spellbinder, his listeners agreed, but there with the solid meat and worth coming a long way to hear. The boys came to learn, and all speakers were encouraged by close attention.

You'll read the various papers in coming issues of the TOOL ENGINEER —'twould take volumes to get them all into one issue besides which the Journal is all set up, just waiting for this report. Hence, the informality. Took time for a bit of sociability with old friends and budding acquaintances. Dropped in on Bill Scheer, formerly with Swedish Gage, Detroit, but now heading his own company in his home town, St. Louis. E. A. Doogan beaming welcome to the visitors. Gang in from Canada; thirteen started but one dropped out so as to break the jinx, making twelve. Met Ed. Barker, Len Singer, Charley Fisher and Bill Dawson. Asked Jimmy Davis of Montreal to send greetings to—uh, the Wilderness. Did he? Missed the Duke and his regal consort. Charter members Al Sargent and Ray Farmer among those present, and of course, Geo. Washington Joe Siegel. In constant company, Fred Plante, Glenn Mortensen and Jack Ralston, with their charming ladies. Watch these young men for future developments.

Took a slant at the local papers:—war news, stock market, industry. Local scandal and graft in the headlines, just like in Detroit, Chicago and other big towns. So what? — dirty politics never win in the long run, and the bigger the man the harder he can fall when the decent element finally catches up with him. It always does, because Mr. Average Citizen, is never really fooled, just a bit slow to act and reluctant to fight unethical measures with similar fire. But that's an aside; let's "go on with the A.S.T.E.." Got a lot of fine publicity from the St. Louis press, spreading the gospel of fine Tool Engineering.

Came Friday night, and the banquet. The cocktail prelude, reminiscent of Toronto; a Babel of voices blending into a roar as of rushing waters. The Old Mill Stream, Sweet Adeline. The bugle!—mess call! We file into the banquet hall. Brass Hats and Society Bigwigs lined along the speaker's table. The color guard!—America, the salute to the Flag.

Invocation by Dr. Clark Walter Cummings, lending an air of solemnity to the occasion. Introduction of visiting and local prominent, including Lt. Col. Burnside, tall brother of the tall, new 2nd A.S.T.E. Vice Prex. Dignified Capt. S. S. (Steamboat Steve) Yeandle, U. S. Coast Guard, with whom I share several mutual acquaintances.

Installation of the new officers, with appropriate comments by the ordained; a parting gift to Frank Curtis, retiring Prex. Rear Admiral Downes, representing Col. Knox, Secy. of the Navy. The Admiral put things frankly but factually, told us of the need for production and extolled us for our work in engineering the tools for production. No drama, but forceful impress of the needs of the times.

Came the speaker, Dr. Charles Copeland Smith, born in England but an American by choice. Ah, there was drama!—and subtle as well as broad humor. The finished orator at his best because he was in deadly earnest. He humbled us and exalted us, castigated us and salved us; inflicted on us the supreme pain of thinking. His was a truly great speech. Most impressive of all, to this reporter's mind, was the charge that 24 million days of labor had been lost during '41 as a result of jurisdictional disputes and unnecessary strikes — enough, no doubt, to have swayed the balance in our favor at Pearl Harbor and Manila had those hours been directed to production of guns and planes. Well, Pearl Harbor changed that! — now, America must forget its differences in the great issue of winning this war.

A born orator, Dr. Smith is also a born trouper with a plus element; where the mere trouper leaves 'em laughing, Dr. Smith evoked the laugh as an ante climax, left us with a serious thought. The main course done, we relaxed to the dessert of entertainment, capped by a Sergt.(?) Schultz who told a few unvarnished tales of his experiences(?) in the last world war. Finis!

Stole away to bed, but got waylaid by a quintette comprising Deacon Sprott and Red (previously referred to as Tall-in-the-Saddle) Collins of Tennessee and Texas, respectively, and Jack Marvin, Art Denis and R. E. Garwood, all of the Coast, and, along with Otto Winter, forcibly arrested and brought to trial. It seems that, in a moment of mental abberation, Otto had asked me to take the Editorial Chairmanship, Irwin Holland having disowned the headache, and the boys from the Golden West took the news—or shall we say rumor?—seriously. At any rate, they took the Tool Engineer pretty seriously, and I'll admit that both the new Prex and myself learned a lot about what the boys North, East, West, South want in the line of reading matter. We also learned what they want in the running of the A.S.T.E. We should have, having been on the pan from midnight until almost 6 A.M., the interval relieved only by sandwiches and coffee. Imagine leaving me without coffee for almost ten hours! Anyway, those boys crammed us with plenty of mental food, and gave me personally enough material to fill the Handy Andy column for the next few months. Be all that as it may, we met as casual acquaintances and parted enduring friends. You'll hear more about 'em, and everything to the berries.

One thing that was brought out during the rump editorial discussion (which ran the gamut of A.S.T.E. activities) was that where Frank Curtis will go down in A.S.T.E. history as the Great Expansionist, it is Otto Winter's golden opportunity to become the Great Constructionist. We have attained quantity; now, we shoot for quality. Well, I think that Otto has the makings. He has had a lot of experience, has given the Society many good ideas, some of which have never been accredited to him, but now, the future rests entirely in his own hands. He is on his own, with the hopes of the membership pinned on his doing great things. Well, it seems that Time has been grooming the man, and a great national crisis that also is a critical period in this Society has created the Hour for the man. Set your course, Otto—and to hell with the torpedoes!

Tool Engineering DATA SHEET

HARDNESS CONVERSION TABLE

While this table is especially prepared for use with plain carbon, nickel, chromium-nickel, chromium-molybdenum, chromium, and chromium-vanadium steels, it is believed to be fairly accurate for tungsten high speed steels and high chromium stainless steels.

10 MM Ball 3000 Kgm.	120° Cone 150 Kgm.	1/16" Ball 100 Kgm.	Model C	1000 Lb. Per Sq. In.	10 MM Ball 3000 Kgm.	120° Cone 150 Kgm.	1/16" Ball 100 Kgm.	Model C	1000 Lb. Per Sq. In.
Brinell	Rockwell C	Rockwell B	Shore Scleroscope	Tensile Strength	Brinell	Rockwell C	Rockwell B	Shore Scleroscope	Tensile Strength
800	72	...	100	...	276	30	105	42	136
780	71	...	99	...	269	29	104	41	132
760	70	...	98	...	261	28	103	40	129
745	68	...	97	367	258	27	102	39	127
725	67	...	96	357	255	26	102	39	125
712	66	...	95	350	249	25	101	38	123
682	65	...	93	337	245	24	100	37	119
668	64	...	91	326	240	23	99	36	117
652	63	...	89	318	237	23	99	35	115
626	62	...	87	306	229	22	98	34	113
614	61	...	85	299	224	21	97	33	110
601	60	...	83	292	217	20	96	33	107
590	59	...	81	290	211	19	95	32	104
576	57	...	79	281	206	18	94	32	102
552	56	...	76	270	203	17	94	31	100
545	55	...	75	268	200	16	93	31	98
529	54	...	74	259	196	15	92	30	96
514	53	120	72	254	191	14	92	30	94
502	52	119	70	247	187	13	91	29	92
495	51	119	69	244	185	12	91	29	91
477	49	118	67	233	183	11	90	28	90
461	48	117	66	227	180	10	89	28	89
451	47	117	65	223	175	9	88	27	86
444	46	116	64	219	170	7	87	27	84
427	45	115	62	209	167	6	87	27	82
415	44	115	60	204	165	5	86	26	81
401	43	114	58	196	163	4	85	26	80
388	42	114	57	191	160	3	84	25	78
375	41	113	55	184	156	2	83	25	76
370	40	112	54	182	154	1	82	25	75
362	39	111	53	179	152	..	82	24	74
351	38	111	51	173	150	..	81	24	74
346	37	110	50	170	147	..	80	24	72
341	37	110	49	168	145	..	79	23	71
331	36	109	47	163	143	..	79	23	70
323	35	109	46	158	141	..	78	23	69
311	34	108	46	153	140	..	77	22	69
301	33	107	45	148	135	..	75	22	67
293	32	106	44	144	130	..	72	22	65
285	31	105	43	140					

Courtesy—Vanadium Alloys Steel Co., Whitman & Barnes

NOTE: This is the sixth of a series of Data Sheets which will be published in THE TOOL ENGINEER hereafter. A handy three ring binder can be secured at any book, stationery, or dime store and will hold the sheets for convenient and frequent reference.

The Tool Engineer must build machines that do the job better with fewer man hours. His is an enviable assignment.

Man-Hours the Price of War

By B. W. Keese

Vice-President in Charge of Engineering, Wisconsin Axle Division
Timken-Detroit Axle Company

MECHANIZED war has loosed robots to destroy life, humanity and materials.

Billions of dollars of material are being demolished and we are facing a tremendous economic loss — a mortgage on the future. But let us look closer. The money is not being lost, but increased in rate of circulation.

What about material? It too is not entirely lost, but is transformed into wreckage and scrap with the exception, of course, of ammunition which is difficult to reclaim.

What do we then lose? We lose man hours, the energy, skill — "the sweat of the brow"—and the time necessary to produce the material or to reclaim it. Labor enters into every phase of construction. The ore in the ground is useless without labor, the ore on the ground is useless without labor—the resulting steel is useless without further labor, and the finished product can only be used with labor.

Labor which is man-hours is expendable and cannot be reclaimed.

Skill in the Machine

Since we cannot save man-hours, we must conserve man-hours by getting more material or production with less expenditure of time and energy. The Tool Engineer stands in the enviable position of calling upon all his resources to increase production, to increase accuracy and decrease the scrap, and throughout to decrease the hours in man-hours.

Accuracy or precision conserves inspection time and wasted time in salvage, or replacement time in scrap which saves the hours in man-hours. Ease of operation and elimination of fatigue saves the energy and the man.

Take the man in man-hours. Since there is a shortage of skilled men or mechanics and we have little time to train them, the Tool Engineer must build the skill into the machine or the fixture to the extent that only an operator is required, and even then the operator must be able to control a bank or group of machines. The man must further be conserved by designing safety features, guards, dual controls and protected cutting edges.

So limited are we in man-hours that it is now considered expedient to reclaim, repair and salvage mechanized vehicles at the front or adjacent the front. With production at capacity, new units are often not available and the repair or restoration of a disabled unit, though with a tremendous man-hour expenditure, is a deciding factor in superiority of numbers. The reclamation of any material processed in any degree above its fundamental state conserves man-hours. Hence, Hitler's practice of confiscating in conquered territory all metals, even consisting of door knobs, brass plate, rails and iron fences and returning them in otherwise empty trucks, is conservation of man-hours as the labor is not lost in processing the metal from the ore.

"The country which accomplishes most with least man-hours wins."

Interchangeability

Assuming 4000 man-hours are required to construct a unit, a designer who creates a machine or fixture which would speed production 10% would release one man's work for one week or obtain a portion of another unit.

Unfortunately tools of destruction require extreme accuracy and the very best of heat treatment and materials to obtain the maximum in strength and minimum of weight; therefore, quality cannot be sacrificed at the expense of production. Extreme interchangeability must be maintained so that one disabled unit can be robbed to repair another disabled unit, again requiring quality. Excellent precision must be had to permit quick changeovers so often conducted under fire or attack.

And most important—a premature failure due to flaws in material or improper machining must be guarded against as it would be not only most destructive to our own forces, but equally demoralizing. Fortunately, considerable man-hours have already been expended in designing, produc-

ing, and testing, for example: The United States Army was the first in the world to manufacture self-propelled artillery. To quote General Wesson:

"As early as 1926, the Ordnance Department had completed the manufacture of several self-propelled mounts for various calibers of artillery. With the decided change in tactics used in the present war in Europe, it has been necessary to develop self-propelled artillery for various missions. Of course, it is known and realized that the best defense against a tank is another tank. However, the great cost and time of manufacture of tanks makes it necessary that self-propelled anti-tank weapons be used. In many cases, self-propelled artillery is being developed to perform definite missions other than for use against tanks.

"With the aid of the automotive industry, this second phase of development of self-propelled artillery by the Ordnance Department is proceeding at a rapid pace. For example the 75-mm. "tank destroyer," a 75-mm. gun mounted on a half-track vehicle. Only 75 days were consumed from the time this idea was conceived to the time units were actually in the field.

"The self-propelled artillery program is extensive, and the Ordnance Department has brought 13 different manufacturers into this work. This program calls for the mounting of all sizes of artillery, starting with the 37-mm. gun up through and including the huge 155-mm. gun. Commercial parts as well as parts of tanks that are in production are being utilized almost exclusively. With the new program calling for the manufacture of huge reserves of artillery and tanks there are to be manufactured several thousand pieces of self-propelled mounts, all of which are ready for almost immediate production."

Keep Stride

Since self-propelled mounts cannot use commercial vehicles in their entirety, the Tool Engineer has been called upon to keep stride with the ever increasing production demands which today are only the beginning—only the beginning.

Look at the tanks and the man-hours expanded.

The first present day light tanks were built by the government in about 1934 and the design tested, improved and tried in the following years until the first 329 tanks were placed with an outside manufacturer October 3, 1939. The pilot tank with soft-steel plate was completed by January 1940. The first armor-plated tank was started March 22, 1940, and was completed and accepted April 30, 1940.

When you consider over 13 tons of expensive material you get some idea of the man-hours necessary to produce one unit.

An Amazing Tooling Job

The job of putting the medium tank into production, considering the size of the project, has been amazing. In June, 1940 the ordnance officers began from scratch, but of course with a big fund of data, information and experience to go on. That is, they were up-to-date on what was needed. By September 1940, the layout of the medium tank had crystallized. By October, 1940, pilot models of major components had been built and tested, and the tank manufacturers had meetings with the ordnance officers to iron out the last details of the design. Orders were placed. In May 1941, the first production models were completed and in June, finished medium tanks started rolling off the production lines, almost exactly a year from the day when the project began from scratch. In that time not only were the designs perfected but a manufacturing plant was built, tools, jigs and gages made, manufacturing organizations assembled, and materials procured. Now finished medium tanks are coming off the production lines of the six manufacturers daily.

The Tool Engineer Is Never Through

With designs completed, units tested, approved and production under way—it is up to the tool and machine designer to conserve man-hours whether it be in the mine, in foundry, in the rolling mill or in the shop. When the machine designer has stepped up production to the limit of improved cutting tools, feeds and speeds with bearings, gears, driving and operating mechanisms which will live 24 hours a day for 365 days a year the Tool Engineer is not through.

To save further man-hours, he must then design to eliminate loading time, which is the one variable left by providing multiple loading stations, quick acting consolidated clamping devices.

The country which accomplishes the most with the least man-hours will win.

Conserve Man-Hours Throughout the Plant

Often we are reluctant in carrying conservation of man-hours throughout the plant and into every department.

Visual inspection is the most difficult phase of inspection unless the inspector is trained so thoroughly that the operation becomes reflex. Give that same inspector a gage or a tool and the operation immediately becomes automatic.

If the operation is of such nature that a tool cannot be provided, then a check-off system—a card with every point to be noted indicated thereon, with a place for a check-mark—is beneficial.

While we hesitate to make a man a robot, we all are of the machine age, and the more automatic an operation becomes, the more certain will it be checked accurately.

The Tool Engineer can conserve many man-hours by producing quick acting automatic inspection gages and tools. The same conservation can be effected in painting, crating, and other fields likely to be neglected.

By use of comparatively inexpensive fixtures, contour saws lower costs and release heavier, more expensive machines for work to which they are especially suited.

Contour Sawing Fixtures

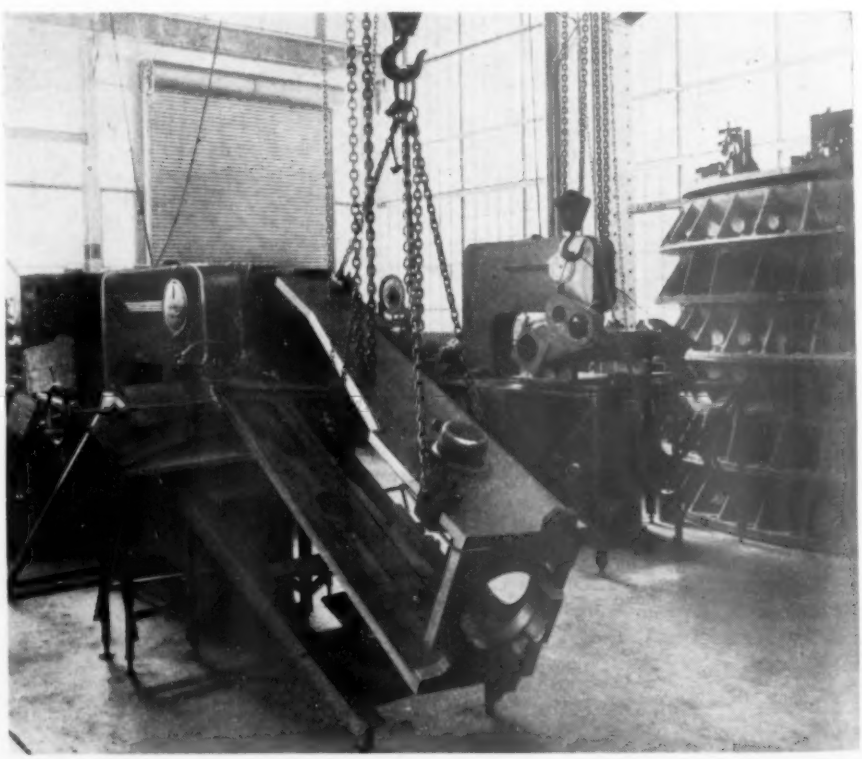
Release other production machines

By H. J. CHAMBERLAND

Production Engineer, Continental Machines, Inc.
Minneapolis, Minn.

WE should be thankful for the fact that when the "JAPS" started the fireworks, we had passed through the first stages of our defense program and had already made a deep gash into the final phase, namely, production. If there ever were times when more minutes per hour and smaller scrap piles meant anything, that critical period is surely here now and that is where "contour machining" comes into its own.

The revolutionary metal-cutting or shaping process known as "Contour sawing" was developed about eight years ago. No sooner was the green light on to speed up plane, gun, tank and machine tool production, than we started to speak of this rapid cutting technique in terms of "contour machining." We no longer consider this form of specialized equipment as being confined to cutting tools, dies and other small parts. Increased machine capacity and superior construction allow the sawing of material weighing more than the machine itself and handling lengths of 18 or 20 feet are nothing unusual. Only a few years ago we were astonished at the accurate sawing, within 0.003″ or 0.004″ from top to bottom, of pieces of steel 8″ or 9″ thick. Today, cuts 12″ thick are made with regular equipment and a



Heavy anti-aircraft gun slide, held in position with crane and supporting fixture to provide a 25° cut on a radius. Contour sawing saved ⅔ of time formerly required.

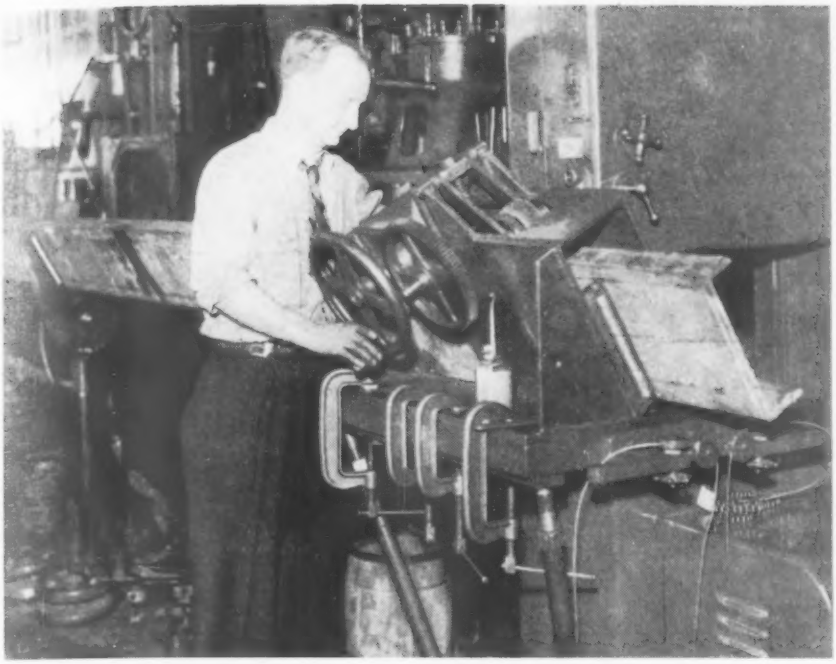


Figure 1
Contour Sawing applied to 15 foot long power shovel dipper stick.

maximum of 30″ with specially designed machines is possible.

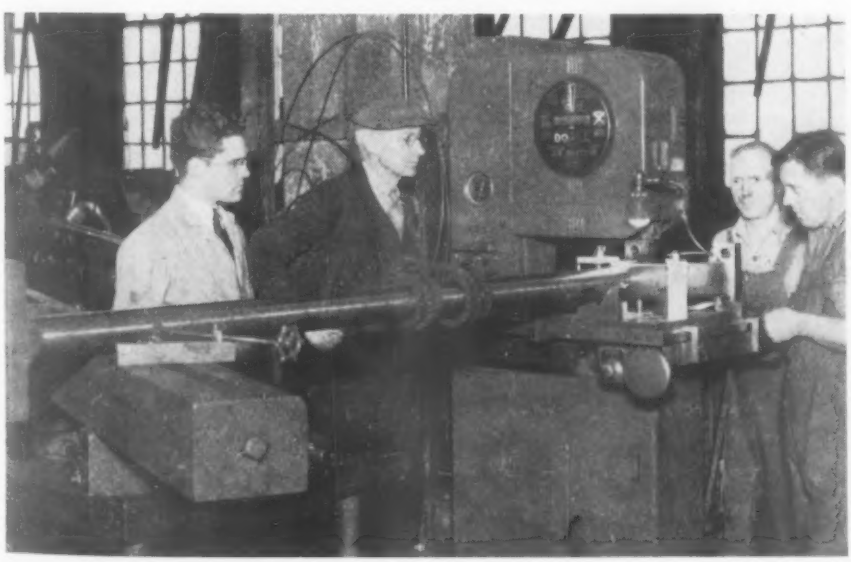
Contour Sawing

The rise of the contour sawing procedure to the height of a quantity production form of machining was obviously due to the introduction of ingeniously developed fixtures or attachments. While numerous accessories to increase the versatility of the equipment are already available, users of contour sawing machines invariably design, for production purposes, fixtures that will suit their individual needs.

Realizing the vast savings in time and material effected by contour machining, the cost of any fixture is usually immaterial. Experience had shown that many fixtures have paid for themselves the first 48 hours of use.

A vast number of the sub-contract plants are more or less affected by a shortage of basic machine equipment. Production reports from aircraft plants show that every contour machine usually releases from one to three conventional machines and thereby speeds up production tremendously. The proof of this is found in the interesting fixtures now used in some plants to expedite contour machining. After all, designing fixtures to fit ones requirements, is the Tool or Production Engineer's responsibility. That is why this information should be so interesting.

Figure 2
Handling a 310 pound eccentric rod where both straight and curved cuts are made.



Roll-Feed Fixture

Figure 1 shows a roll-feed fixture for a production operation at the Koehring Company, Milwaukee, Wisconsin. The material being sawed is as tough as armor plate. The part is a steel "channel" 15 feet long and 15 inches wide. It is used for the dipper stick of a power shovel.

The operation is to bevel the edges of the channel. One side of the channel form is being cut on an angle as shown. After cutting one side, the piece is reversed for the opposite cut.

This job had previously been done on a large planer and it took 3 hours. It is now being done in 2 hours by contour machining. One may argue that in this case the savings in time and material are nothing to brag about. Well, let's look at it from another angle. The operating cost of the planer was $6.50 per hour and that of the contour sawing machine is $1.50 per hour, so $16.50 is saved on each part. At this rate, the fixture would pay for itself in 288 hours on this particular job. Furthermore, the fixture is now motorized and relieves the operator for other work most of the time.

Cutting Curved Part of Rod

No less interesting is the fixture used in *Figure 2*, at the plant of the Filer & Stowell Co., also of Milwaukee, Wisconsin.

The part is a 310 pound eccentric rod for a 2500 horsepower triple expansion marine engine. The work is clamped in a fixture on a sub-table. The cut proceeds straight until it reaches the curved part. Then the sub-table is locked and the fixture swings at the proper radius to develop the correct curve for the part.

This is a production job. It is done in one hour by contour machining. It formerly required seven hours of boring and slotting. Now, the latter ma-

chines are relieved for cuts requiring less material to be removed.

In Naval Ordnance

In *Figure 3* is shown a contour machining fixture in a Naval Ordnance plant now making anti-aircraft and submarine guns. The part being machined on a production basis is the gun slide and the component part of the carriage which mounts the gun. These pieces are heavy and so are placed on the reinforced machine table by means of a crane.

The operation performed is that of cutting an 8″ radius on both ends of the gun slide at a 25-degree angle. The gun slide has two trunnion bearings, one on top and one on the bottom. The trunnion on the bottom nests in a socket of the fixture. This permits the gun slide to pivot into the saw to generate the 8″ radius curve. As shown, the fixture is mounted at the proper angle. To cut the upper end, the fixture has to be reversed.

Because of the fast production on this particular job, the fixture is designed to be easily removable. Taking off four bolts is all this requires. This restores the machine for conventional use.

These same gun slides were formerly machined in a high-price milling machine. Ten hours were consumed milling each one. With contour machining the time has been reduced to three hours and an expensive milling machine released for more profitable operations.

An arrow points to the piece of stock just removed. This requires a cut 24″ long at the bottom and 18″ long at the top of the gun slide. The material is 2″ thick and made from 4620-SAE steel.

Circular insert in *Figure 3* shows a newly developed attachment which permits lubricating the saw. This is most desirable for cutting some of the tough materials now used for defense.

Sawing Air-Plane Parts

Another interesting production fixture is the one shown in *Figure 4* and used at an Aircraft Works. The operations consist of stack-sawing the various parts for airplane skiis. In the actual set-up, 12 sheets of Duraluminum stock are simultaneously being shaped to outline. Note the skid-like construction feature and circular pipe rail, the latter gives unlimited movement for the stack.

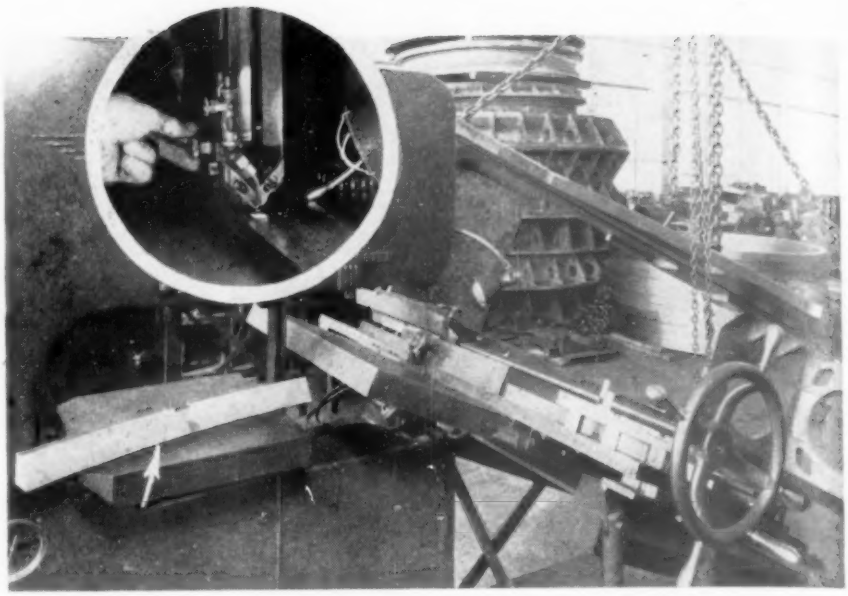


Figure 3
Making a curved and beveled edge on naval gun carriages at one operation. Insert—shows how saw blade is lubricated.

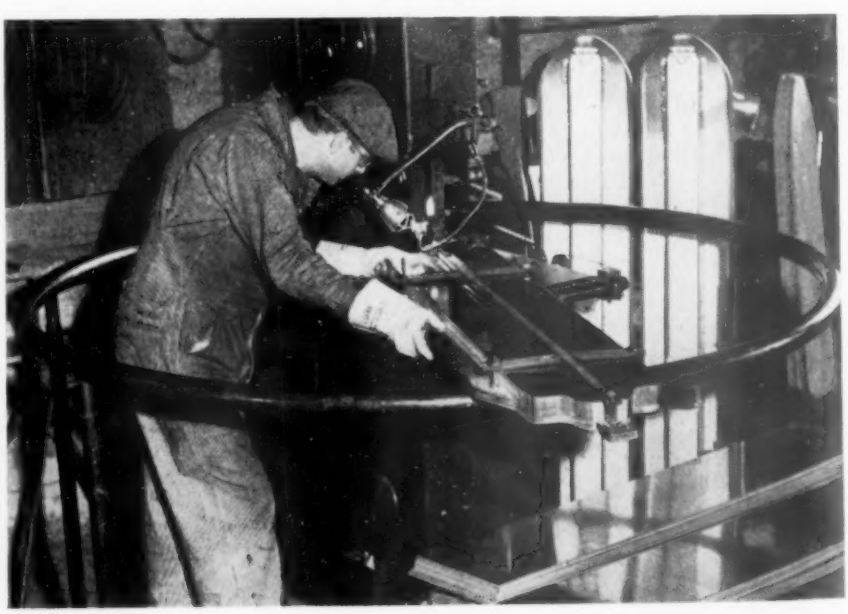
These parts used to be cut one at a time with large hand shears and there were 48 cuts to a pair of skiis. The saving in time the new way is tremendous and a much cleaner cut results.

Finishing Diesel Wrist Pins

Figure 5, illustrates an outstanding contour machining operation, at the Nordberg Mfg. Co., Milwaukee, Wisconsin. This is a production job on 350-pound wrist pins for diesel engines. It consists of cutting parallel flats on both ends of the pin. It was formerly performed on a milling machine and took about seven hours. The sawing time is only two hours and the four pieces, removed intact, weigh a total of 50 pounds. Incidentally, this material, removed in such large pieces, is by no means a total waste as are the chips from a miller.

The design of this work-holding fixture may be for similar applications in other lines. An auxiliary table is used in this case, and also in that shown in *Figure 6*. These tables in standard or special form may be obtained from the manufacturers of the machines. Adjustable table supports

Figure 4
Airplane parts are easily handled in stacks by providing an outside support.



shown in *Figure 6* are of standard design while in *Figure 5* they are of shop-made construction.

Note that in the latter, there is a lay-out of holes in table. These are duplicated in the base of the fixture. This arrangement guarantees positive locations for all sawing positions and therefore speeds up production to a maximum degree by reducing set up time.

These tables have a roller bearing type of construction. The bearings are protected by felt wipers and hardened steel strips. The table may be manually or automatically fed to the saw. As readily seen, the type of slide mechanism is a matter of individual choice.

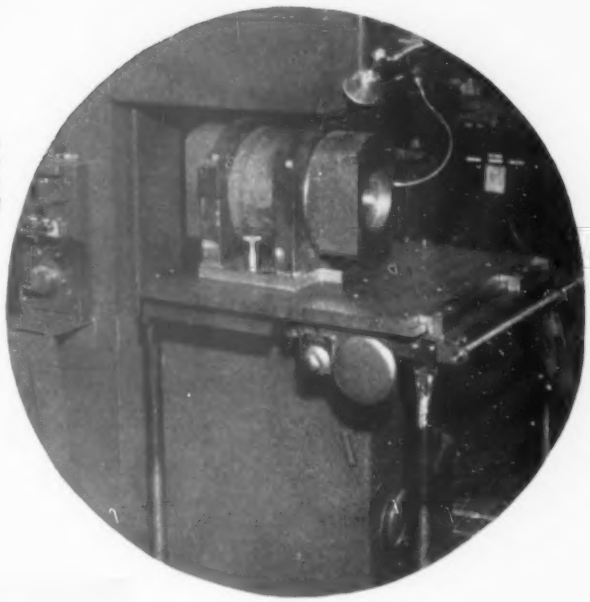


Figure 5
Sawing parallel faces at each end of a Diesel engine wrist pin saves time and stock.

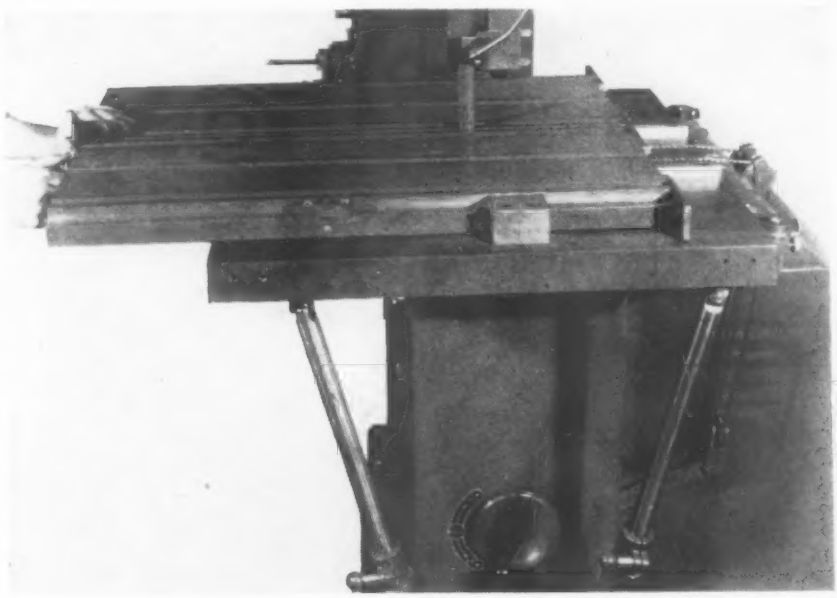


Figure 6
Left: Auxiliary table and universal adjustable table legs are furnished by some tool manufacturers.

Performing Slotting Operations

The set-up shown in *Figure 7* is quite simple. It has proven very profitable. The operation is cutting a slot in ⅜" thick mild steel. It had always been a stamping job but that produced badly torn edges. Milling these parts was tried for a time. Now they are being sawed as shown. This change tripled the production.

Note how simply the work is clamped to the fixture. The fixture is automatically fed as shown. A bar, A, clamped to the table stops the feed at the end of each cut. Shifting a ¼" wide bar, B, located between the fixture and one of the parallel plates changes the position of the part and fixture to obtain the correct width between the first and second cuts. 250 of these parts are now sawed on this machine every 10 hours.

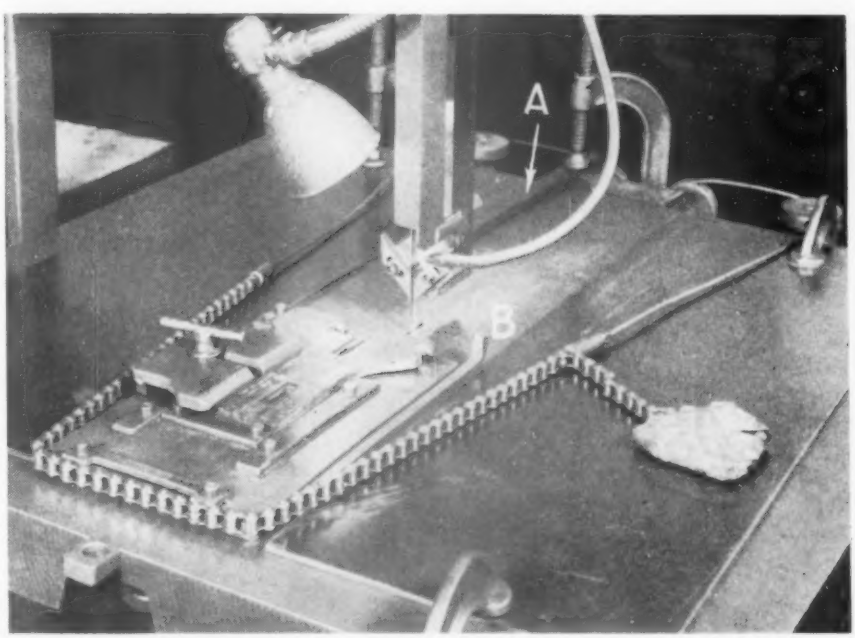
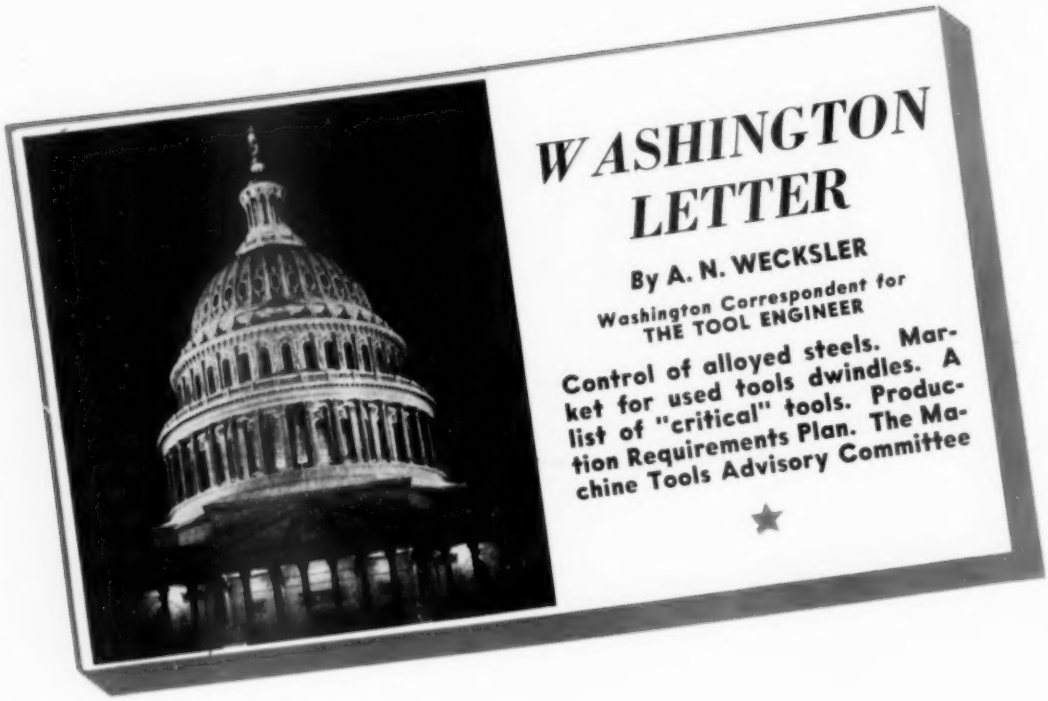


Figure 7
Our example of slotting which requires only a simple fixture and clamped on guide plates.



WASHINGTON LETTER

By A. N. WECKSLER

Washington Correspondent for THE TOOL ENGINEER

Control of alloyed steels. Market for used tools dwindles. A list of "critical" tools. Production Requirements Plan. The Machine Tools Advisory Committee

★

PROBLEMS of metal scarcity due to war requirements are becoming of immediate concern to the tool industry, with warnings being issued by the War Production Board that scarcity of nickel might rule out the use of this alloying metal in machine tool castings entirely.

The increasing scarcity and need for conservation is not restricted to any one metal. In the case of alloying metals, the shortness in supply of tungsten led to large scale demands for molybdenum by both United States and British users. The familiar cycle in the case of substitutes prevails,—as consumers of a scarce material shift to some less critical item, the substitute tends to become scarce.

In prospect, and already under close study, is the control over the end uses of alloyed steel, with the Government restricting the usage to which alloys can be put. Example of this trend is the letter addressed by George C. Brainard, chief of the WPB Tools Branch, to "Machine Tool Builders". The letter reads as follows:

"This letter is to serve the purpose of advising the machine tool industry of a critical situation developing in the supply of nickel especially in respect to its use in machine tool castings.

"The industry is facing a condition where the use of nickel for this purpose may be removed entirely. The allocation for the next two months is being drastically cut down. This Branch has been directed by the Army and Navy Munitions Board to bring this to your attention so that you may be planning on a program which will enable you to meet this situation and to have your respective foundries experiment in the production of gray iron casting without the use of nickel or by using some substitute which may be available. In other words, machine tool builder foundry sources should immediately start research work which will enable them to assist and relieve the present nickel shortage."

Demands for tools by industries in the process of conversion and new plant units coming into production have become increasingly reflected in the market for used tools.

Stocks of used machine tools in the hands of dealers have dwindled, especially in the case of "critical" tools.

Boring Mills, Vertical, over 60"; forging hammers and presses; planers, 6' to 10', table width; horizontal boring mills, 3" and up; gear hobbers, 48" and up; job borers; die sinkers, Keller type; large planer type milling machines.

Considered critical are: boring mills, vertical, up to 54"; boring mills, vertical, 10' and over; planers, under 6'; milling machines, knee and column types; turret lathes, 2½" bar and up; thread millers; engine lathes 20" to 36"; engine lathes 36" and over; precision boring machines, Heald and Ex-Cell-O types; thread grinders; automatic screw machines; tool and cutter grinders; cylindrical grinders; internal grinders; radial drills; broaches; bevel gear cutters; profilers, and centerless grinders.

In addition to seeking idle tools, WPB is attempting to make use of any fractions of machines that are available.

The War Production Board is planning such a program to assure an adequate and constant flow of materials, supplies and tools to facilitate uninterrupted production through the Production Requirements Plan. PRP — as the plan is known,—is designed to assure manufacturers of materials and supplies needed over a three-month period. Once the complicated PD-25a reporting form called for under the order is filed, the manufacturer is supposed to be relieved of the necessity of filing PD-1A forms, and does not require the assistance of blanket ratings supplied under "P-orders".

Major objection to PRP is the complicated reporting form required under it.

And industries that are rapidly expanding are hardly in a position to estimate their rigid requirements over a future quarter year. These industries would have to apply for special aid in the form of interim applications under the PRP.

A simplified plan has been developed for manufacturers doing a gross business of less than $100,000 annually. This simplified version calls for the filing of reporting form PD-25X. This plan may be broadened to include manufacturers doing a gross of $1,000,000 annually.

WPB actions of direct concern to the tool industry are:

February 27—Supplementary Order No. E-2-a, directing the use and distri-

ICTORY
WILL BE WON *ONLY* BY WORK!

● Let's face the facts. America is in desperate need of war materials. The turret lathe is a key machine tool in the production of these materials. Warner and Swasey are working three shifts, night and day, to turn out new turret lathes. In 1942 we will deliver *six times as many* machines as we built in any normal year. Yet the combined output of new machines by *all* turret lathe manufacturers falls far short of the need.

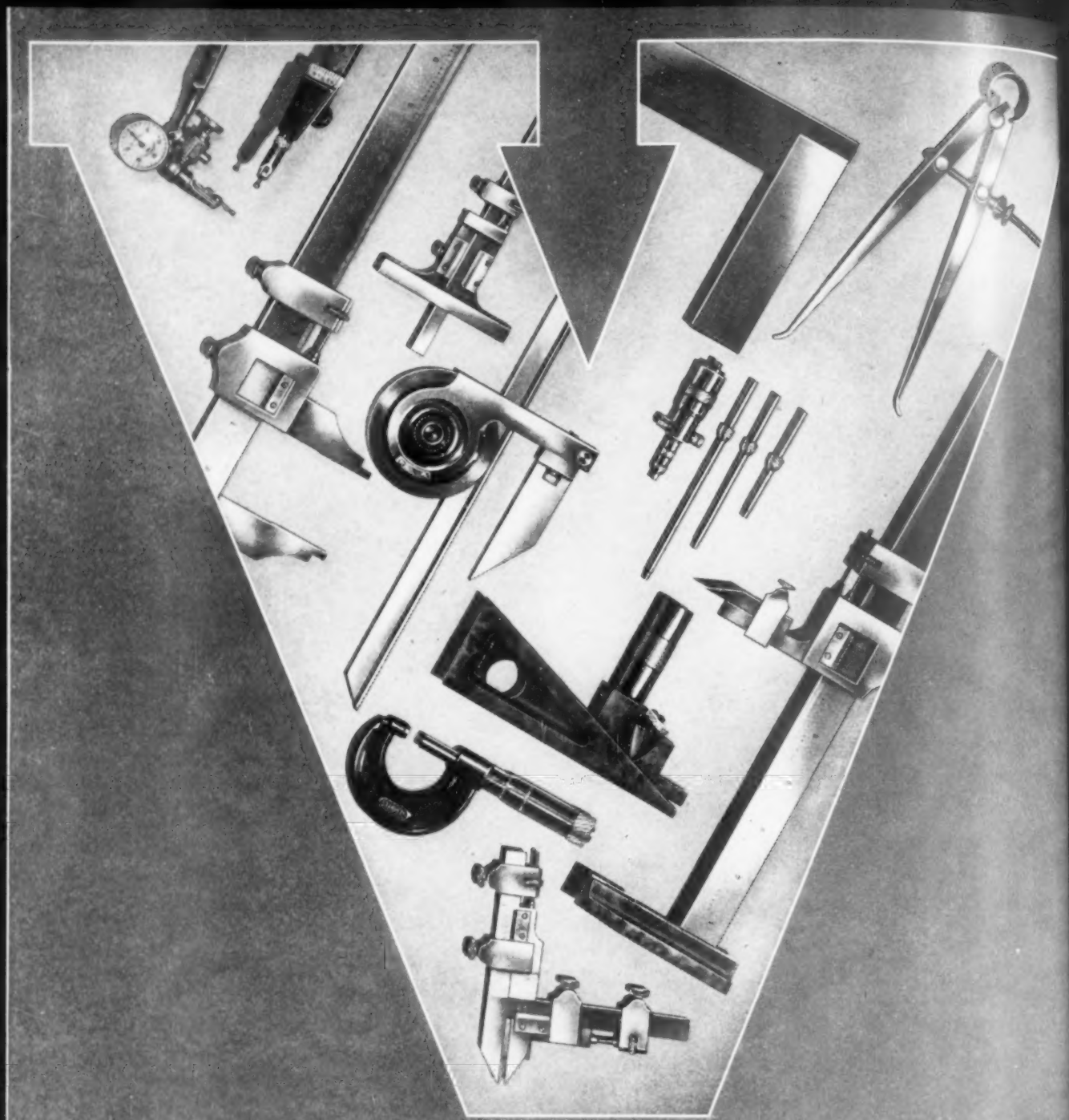
There can be only one solution! *Turret lathes now in the hands of patriotic operators must produce more.* Toward this end, our twenty-one salesmen are instructed to subordinate sales effort and to offer their knowledge and experience to war plants to help find ways and means of making *all* machine tools—*everywhere*—more productive.

GET MORE PRODUCTION FROM OLD AND NEW TURRET LATHES—WE CAN HELP YOU! WRITE

WARNER & SWASEY
Turret Lathes
Cleveland

YOU CAN TURN IT BETTER, FASTER, FOR LESS . . . . WITH A WARNER & SWASEY

STARRETT TOOLS



...– for VICTORY

Starrett Tools in the hands of skilled American craftsmen are helping to create the decisive margin of superiority that will soon spell VICTORY. Write for Starrett Catalog No. 26T.

THE L. S. STARRETT CO · ATHOL · MASSACHUSETTS · U·S·A·

World's Greatest Toolmakers

STARRETT

PRECISION TOOLS • DIAL INDICATORS • GROUND FLAT STOCK
HACKSAWS • METAL CUTTING BANDSAWS • STEEL TAPES

bution of cutting tools, extended by the Director of Industry Operations to remain in effect until revoked. The order was scheduled to expire February 28. This order forbids deliveries of cutting tools except in connection with defense orders bearing preference ratings of A-10 or higher, and requires a certification from the purchaser that the delivery of the tools ordered will not increase his inventory above a 90-day supply.

March 9—Preference Rating Order P-11-a, which assigns ratings of A-1-a, A-1-b, A-1-c for the use of producers of metal working equipment specifically permitted to operate under the order, has been extended to June 30, 1942. The order was scheduled to expire March 15.

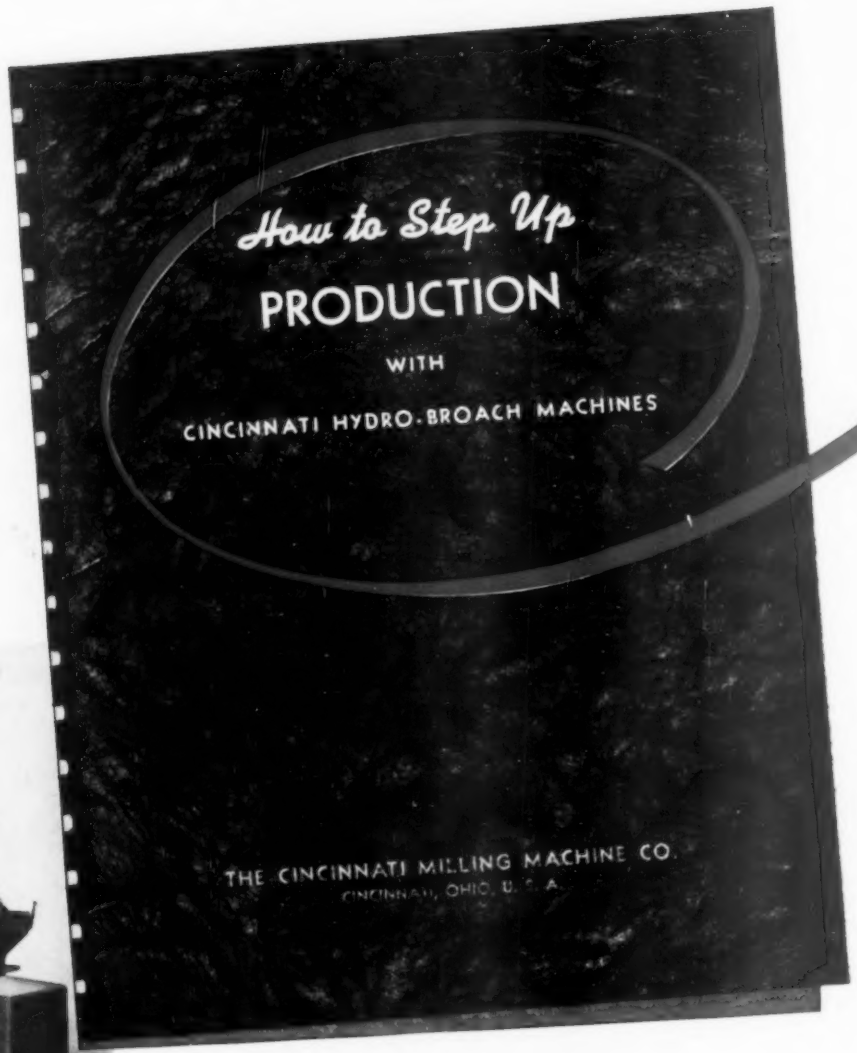
March 9—Preference Rating Order P-39, which assigns a preference rating of A-1-c to deliveries of materials for the production of Arc Welding and Resistance Welding Machines, extended to May 1, 1942. It was scheduled to expire on March 15. Companies operating under the terms of the order were advised of the extension, but at the same time were warned that the order will not be further extended and advised to apply for priority assistance under the Production Requirements Plan.

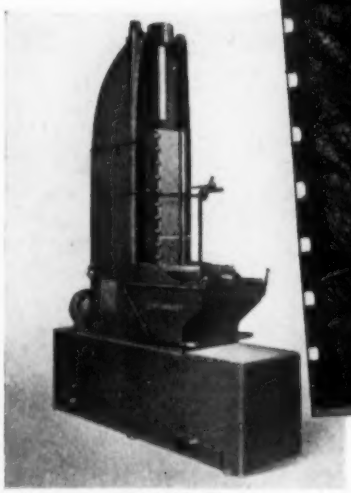
March 12 — Molybdenum supply placed under complete allocations system by Preference Order M-110.

March 24 — Machine Tools Industry Advisory Committee announced. George Brainard, chief of the WPB Tools Branch will act as Government presiding officer. Committee members are: H. S. Beal, general manager, C. B. Cottrell & Sons, Westerly, Rhode Island; A. G. Bryant, sales manager, Cleereman Machine Tool Co., Green Bay, Wisconsin; Ralph W. Burke, general sales manager, Kearney & Trecker Corporation, Milwaukee, Wisconsin; Ralph E. Flanders, president, Jones & Lamson Machine Co., Springfield, Vermont; A. K. Ingle, president, Consolidated Machine Tool Corp., Rochester, New York; R. F. Ingram, secretary and sales manager, Landis Tool Company, Waynesboro, Pennsylvania; George H. Johnson, president, Gisholt Machine Co., Madison, Wisconsin; T. S. Ross, president, Rivett Lathe & Grinder, Inc., Boston, Massachusetts; W. W. Tangemen, vice president, Cincinnati Milling Machine Co., Cincinnati, Ohio; R. J. Whiting, works manager, Hydraulic Press Mfg. Co., Mt. Gilead, Ohio, and J. F. Miller, Ex-Cell-O Corporation, Detroit, Mich.

March 24 — Consumers of molybdenum notified that due to the lack of time for reporting their April requirements, the allocation plan will be held up and put into effect so that May requirements will be allocated.

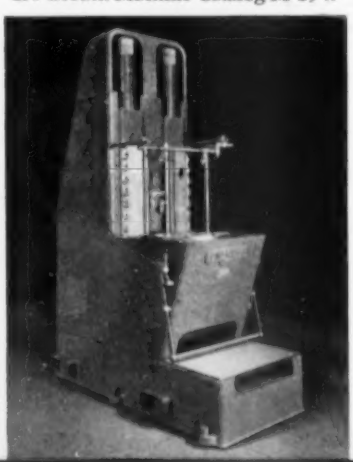
YOU MAY FIND THE ANSWER HERE





Above: CINCINNATI No. 10-66 Single Ram Vertical Hydro-Broach Machine Catalog M-886.

Below: CINCINNATI No. 5-42 Duplex Double Ram Vertical Hydro-Broach Machine Catalog M-894.



THERE are as many answers to the query "how to increase the production of mechanical goods" as there are different kinds of products. Obviously, no one type of equipment covers the entire field of production, but the rate of flow of parts to your assembly line can often be accelerated through the use of an untried or unconventional machining process.

The binder illustrated here—"How to Step Up Production with CINCINNATI Hydro-Broach Machines"—contains many actual examples taken from our machine history files.

> *One example talks about a broach-saw operation and cutters that stay* ***sharp twenty times longer*** *than those previously used. Another example tells of one CINCINNATI Hydro-Broach replacing three other machines, while increasing production six times.*

Perhaps the answer to some problem of production in your shop—faster machining processes, fewer consumable cutters, less floor space—will be found in this book. A copy of it will be sent to men interested in more rapid production.

CINCINNATI

THE CINCINNATI MILLING MACHINE CO. CINCINNATI OHIO U.S.A.

TOOL ROOM AND MANUFACTURING MILLING MACHINES . . . SURFACE BROACHING MACHINES . . . DIE SINKING MACHINES

PRODUCTION PERSPECTIVES...

News of Mass Manufacturing Everywhere

Conversion

A LABOR and machinery supply of 185,000 skilled mechanics, 18,000 lathes, 15,000 grinding machines, 1,400 shapers, almost 16,000 drilling machines, 52,000 welding units, 40,000 buffing machines and 1,600 screw machines has been revealed by the Willys-Overland Survey of machine tools, manufacturing facilities and manpower available for war production in 40,000 automobile dealers' shops in the U. S. The potential productive capacity is equal to that of an arms factory of more than 250,000,000 square feet. Though much of the machinery was supplied several years ago by leading tool manufacturers, minor adjustments could develop 85% of the efficiency expected of modern equipment. It would be suitable for thread cutting, shaft turnings, gear cutting, and smoothing down a variety of airplane, tank and marine parts.

Another dependent of Detroit, the spring and bumper industry, has been almost completely converted to production of armor plate for tanks. A small, 29 year old Pittsburgh firm, for whom $600,000 monthly volume was big production, led the way to $306,000,000 worth of business for itself and fifteen former competitors. Chief contribution of these firms were their heat treat furnaces and experts, plus some presses which could be used for straightening armor plate. In one instance, where the firm did not have equipment to produce according to specifications, the blue-prints were changed. In other instances, the Government provided needed machinery.

If owners of idle machine tools were to list their equipment for sale, it is believed that roughly 50,000 pieces of equipment would be available to war material producers. George C. Brainard, Chief of the Tools Branch War Production Board, requested tool owners co-operation in making such a listing. March 25 was the deadline for American industry to file its first report with the U. S. Bureau of Labor Statistics on the progress of its conversion to war work. The report will provide a national picture, as well as details on why individual companies may not be able to convert as rapidly as is desirable, helping the Government to remedy the limiting factors.

A small Florida city has moved trained ponies, trick dogs and clowns out of the winter quarters of a circus and replaced them with machines for war production. An efficient arms plant is being set up at the country fairgrounds with the machines of several local factories being moved into the buildings, and arranged for assembly line production. This project was stimulated by the head-scratching of city officials who sought a way to pay off back taxes and to replace the income lost from a vanishing tourist trade. Once the idea of a civic war industry was conceived, employment records were taken of every employable. A small order for airplane shop devices gave impetus to a school, and a million dollar order

"GREENIE" — Rap for a Snap

for parts from the Wright plant in Dayton put the whole thing on a paying basis. Costs and profits are being prorated among the companies which have joined the effort.

Materials

Plentiful silver is helping to save scarce tungsten in high-speed-steel tools. Because only a small tip need have the tungsten-alloy, practically all the rest of the tool can be of carbon steel to which the tip can be joined with a less than a .003 inch thickness of silver brazing alloy. The use of silver in ultra-light magnesium alloys for aircraft parts may result in superior physical characteristics. The American Silver Producer's Research Project reports that a magnesium alloy containing 2.6% each of aluminum and zinc, 5.5% silver and 0.2% manganese has a specific gravity of only 1.89. This alloy in extruded bars, rolled sections and large forgings is reported to test, after suitable heat-treatment, a tensile strength of 40,000 to 65,000 psi.; yield strength of 32,000 to 50,000 psi.; elongation from 2 to 10%; and 80 to 95 Brinell hardness. Corrosion resistance is high.

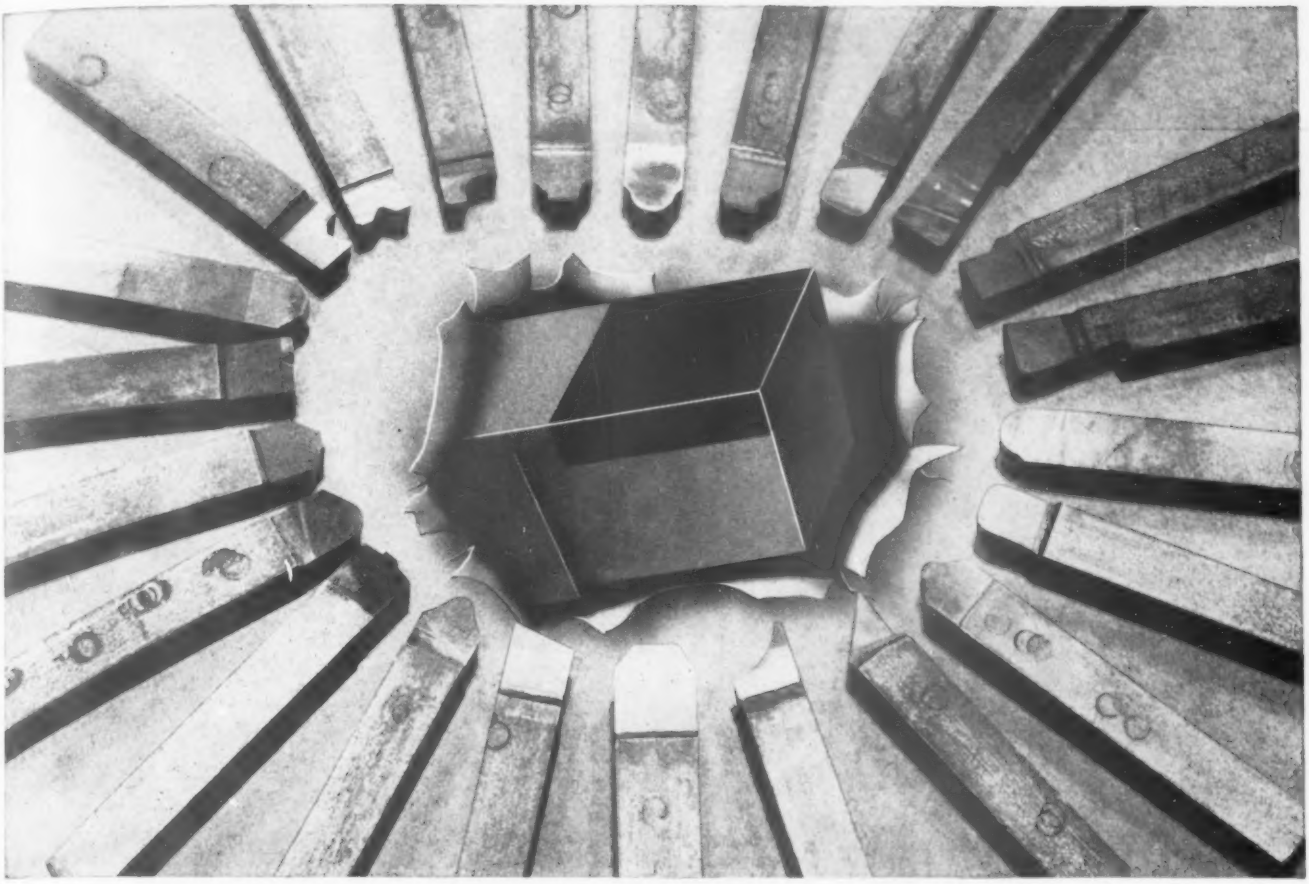
A vast manganese production program from low-grade domestic ores was announced by William L. Batt, Director of Materials. Helping to produce the average need of 14 pounds per long ton of steel, new plants, plus those already in operation should produce well over 600,000 tons a year in high grade manganese concentrates, as compared with 30,000 tons domestically produced in 1939 and 40,000 tons in 1940.

Putting into effect its plan for dealing with "recalcitrant" operators of automobile graveyards, the Bureau of Industrial Conservation requisitioned the entire stock of wrecked jalopies on a lot near Valparaiso, Indiana. The action came after the owner twice refused fair offers for his obsolete cars and miscellaneous scrap. Though the yard was not large, it was estimated that sufficient scrap was there so that, with an equal amount of pig iron, four medium or nine light tanks might be produced. Equally important, it might help maintain an economical operation of open hearth furnaces which face shut-down. Changes in steel specifications will conserve the supplies of hard, tough alloys, according to a report from the War Production Board. In that small quantities of several different alloys are considered more effective than large quantities of any single element, the new National Emergency Steels call for wider use of less strategic metals, restricted use of nickel, chromium, tungsten, cobalt and vanadium. Approximately 18,000 tons of steel, and 180,000 pounds of brass are expected to be saved by elimination of metal jackets, tri-cocks and fusible plugs from low pressure heating boilers.

Expansion

Jacobs Manufacturing Company, largest manufacturer of universal drill chucks in the world has expanded into a 51,088 square foot manufacturing and office building. Accelerating demands for chucks is indicated in requirements of the aircraft industry. Big bombers require as many as 375,000 rivet holes. Improved facilities make possible a 170% production increase over the old plant, with but 57% more floor space. All processing from bar steel to finished product is performed in the plant. Production is divided into departments for heat treat, lathes, automatic machines, etc.

For Chapman Valve Company of Indian Orchard, Massachusetts, largest producer of heavy iron and steel valves, the Navy is financing a $3,600,000 expansion scheduled for summer operation. A new foundry, 500 feet long and approxi-



How You Can Make 200 Special Tools From ONE Style of Carboloy Standard Stock Tool

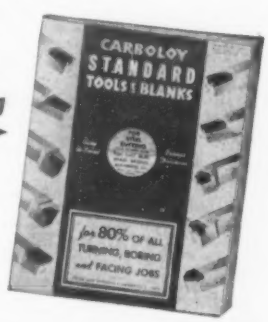
To get special carbide tools on the job *FAST*, a large bushing and bearing manufacturer adapts hundreds of special shapes from Standard-Stock Carboloy Tools. Illustrated are a few of over 200 different shapes, used for chamfering, grooving, forming, etc., that this manufacturer adapts from just ONE style of Carboloy tool!

To do this job *fast* they maintain a stock of these standard tools and grind the shapes as required. Many of the simpler types are ground to shape in 5 or 10 minutes, while others, containing complicated angles and radii, held to limits up to .0005", require proportionately longer periods. In every case, these "special" tools can be ground and placed on the job the *same day* requested! No delays awaiting deliveries.

Carboloy Standard-Stock Tools—available in 10 styles—are manufactured by Carboloy in "mass production" quantities and are always available faster than specially shaped tools. Check your special-shape tool drawings against Carboloy Standard specifications. Write for Catalog GT-140.

You Can Quickly Adapt Carboloy Standard Tools to 80% of All Turning, Boring, Facing Jobs.

Send for free catalog →



CARBOLOY COMPANY, INC., 11145 E. 8 MILE ST., DETROIT, MICH.

Chicago • Cleveland • Los Angeles • Newark • Philadelphia • Pittsburgh
Seattle • Worcester, Mass.

Canadian Distributor: Canadian General Electric Co., Ltd., Toronto, Canada

CARBOLOY

Reg. U.S. Pat. Off.

CEMENTED
TOOLS - DIES - DRESSERS
CORE BITS - MASONRY DRILLS
- WEAR RESISTANT PARTS -
CARBIDES

FOR THE MANUFACTURING · MINING · TRANSPORTATION · CONSTRUCTION INDUSTRIES

mately 350 feet wide, will double Chapman's output.

Production

Donald Nelson: "There are two ways to get production . . . first . . . Government to provide blueprints . . . the schedule for when it is wanted . . . adequate facilities . . . and then have management and labor bend every conceivable effort to achieve maximum production quickly. That is the American way . . . There is but one other way . . . that of our enemies . . ." Blueprints have come from the Army and Navy. The President set the schedule. Having

Lt. Gen. William Knudsen inspected Pratt & Whitney to note their progress in all-out production of machine tools, small tools and gages. Left to right, Vice-Pres. W. P. Kirk, Gen. Knudsen and Vice-Pres. W. H. d'Arcambal.

"management and labor bend every conceivable effort" is now the focal point of the drive. Government's nationwide effort is characterized in its broadest sense by sponsorship of a series of 31 regional management-labor conferences and the official Plan Book. Every factory and worker on war production will be enlisted in the common goal of increased production. Two of the regional meetings, held in New York and Boston resulted in "expressions of unanimous determination to increase production," according to WPB representatives. At the New York meeting, dominated by labor and management representatives of machine tool, aircraft and instrument manufacturing plants, the group heard how employees of one plant contributed 176 ideas in one week for speeding production. The Boston conference was electrified into a spontaneous demonstration of their intentions when announcement was made that MacArthur was in Australia. Plans for the Drive which can be carried into the plant are outlined in the Official Plan Book. It covers the problem of stimulating effort. From organization of plant labor-management committees to ideas for progress charts and production suggestions to ways of pooling employee transportation.

Labor

United Automobile Workers (CIO) and the Tool & Die Manufacturers' Association agreed to clear the way for up-graded or semi-skilled workmen entering tool and die shops. This was a decisive step in breaking Detroit's manpower deadlock. Wage stabilization and equalization is left in Washington's hands. Though there's still more to the problem of hiring women for shop work than fitting them for a pair of slacks, most big plants are going ahead on a train-on-the-job basis. However, enough other manufacturers are balking at the prospect to cause Sidney Hillman and others to go to considerable lengths to prove both the value and the need for the girls.

Handy Andy Says—

AMONG comments relative to my recent article on "Design for Reconstruction" (Feb. T/E) a member from East Orange, N. J., implies that my idea isn't so hot. The plan, he writes, "would prove a mere palliative" and the idea that we should "spend our way into a stabilized economy is absurd". As an alternative, he suggests that: "The only real, fundamental & lasting answer to the whole problem is *social ownership of the means of production*".

Now, where have I heard that before? At that, we seem to be heading hell-bent-for-leather toward socialism; in my opinion, this Administration has swung the country farther to the left than ever dreamed of by the "radicals" of a generation or so ago. Of course, the war has accelerated the trend, and labor lobbies have doubtless swayed the Administration toward sanction of joint councils of labor and management — perhaps to *palliate* lags on essential production. Well, I'll not argue the pros and cons of that; we had strikes aplenty during the previous world debate and if cooperation can beget results now, so much the better. We'll see. The point is, however, that these joint councils are just another step in the evolution(?) of socialism. But, assume that we finally have socialism, what then? Well, it's my candid belief that it will prove just another *noble experiment* in which the prime movers will likely as not be among the first to agitate for reform. They'll disown their love child.

▼ ▼ ▼

Socialism (implying state ownership) has been tried time and again over a period of millennia and recurrently found wanting. Even Russia resorts to it only as a means to an end which, as I see it, is social democracy. And, the proving ground of social democracy is Sweden, whose "middle way" between extremes has evoked a great deal of favorable comment in the past decade or so. Anyway, the Swedes are probably the only ones who have been able to make socialism (to call it that) work, and the reason is that they haven't cancelled out either individual initiative or free enterprise. There, labor cooperatives compete with capital, and in turn become capitalistic institutions, and government ownership in nowise discourages private enterprise. The net results are high mass standards of living and a mass prosperity not equalled elsewhere in Europe nor, in the opinion of many observers, even in the United States except in our wealthier industrial centers. But, there's a whale of a difference between social democracy and socialism.

In my estimation, socialism is for the weak, since it implies a paternalism in which there is no further need for the individual struggle for survival. Hence, in the final analysis, it can only degenerate a nation. Of course, there are contradictions, and thesis can be rebutted with antithesis and so on ad infinitum. Take Russia for instance. Russia, which is supposed to be a highly socialized state, is educating its people at an accelerating pace; not only that, but in various scientific fields the Russians have rather shamed their non-Slavic contemporaries. But, there is latent talent coming into its own after centuries of oppression; for them, only one way to go, and that is upward. Yet, as I have previously pointed out, communism (The ultimate in socialism) is not for advanced societies, and has made little if any impress on the highly advanced northern states of Europe.

They find it too slow for the faster and more progressive tempo of social democracy.

▼ ▼ ▼

Most of the progress of the world has resulted from the struggle for survival. But then, so has much of its misery, although that doesn't alter the case. That people, or that class, which strives to achieve economic independence is usually the pace-maker in world progress. But, this class is a small minority and, from all observations, a declining minority here in the United States. As a pat example, we have a considerable proportion of what may be termed dependents, i.e., able bodied and potentially employable men and women who have been living on welfare and public charity. This class is breeding faster than the independents who support it, a mathematical ratio that doesn't augur so well for future generations. So perhaps we'd better have socialism and make everybody dependent. Yet, in direct contrast,—and I refer you to American sociologists and the Encyclopedia Britannica — a small European state is breeding its higher social strata in an ascending scale over the lower. Without "purges" or social or racial discrimination, human standards are being raised hand in hand with the evolution of a workable social and economic system. If we've got to subscribe to an Ism, why not look at "all three" before deciding? At that, I've personally found the American Way very much to my liking, and, like other Americans by choice, I had to come farther to travel it than a lot of you who started from scratch.

▼ ▼ ▼

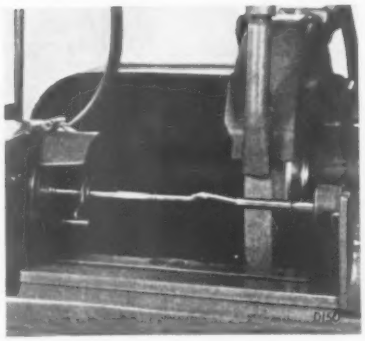
From one thing to another, it looks as if we'd have to revise a lot of estimates. While I have personally been critical of the Administration at times —or rather, impatient with political muddling, of which there is still plenty —recent events tend to prove the President right in his foreign policy. Whether accident or design, (as the heart or the mind may have ruled) dictated the alliance with England, it is now quite apparent that the Axis powers — and especially Japan — had long planned and prepared for the overthrow of democracy. The logical assumption, then, is that the President did not lead us into war. Rather, he tried to prepare us for a war that, at the best, could only have been deferred. Had we waited, or refused aid to Britain, the chances are more than ever that the Empire would have crumbled as a result of the battering of the German war machine. Then, we would have had to face, alone, the combined resources of a Hitlerized Europe. However, it wasn't exactly political acumen nor fine diplomatic discrimination that forced the issue; the Japs did that when they attacked Pearl Harbor. So now, it's not England's war that we're fighting, but our own, and to win, we'll have to reverse the order for which the British so bitterly condemn themselves: we'll make it "enough quick enough."

▼ ▼ ▼

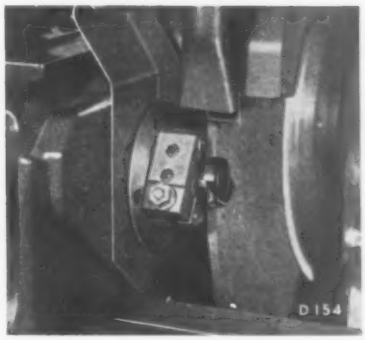
Yes, I share, with many Britons, an impatience with British muddling and procrastination. Like the Latins and their *siestas*, the English just have to take time out for tiffin, be the game cricket, diplomacy or war. So, when the blow fell they just weren't ready, and when they finally got going they got there "too late and with too little". Well, so what? They weren't ready and they knew they weren't ready, even as they must have known of the intensive preparedness of the foe. Yet, when

(Continued on page 147)

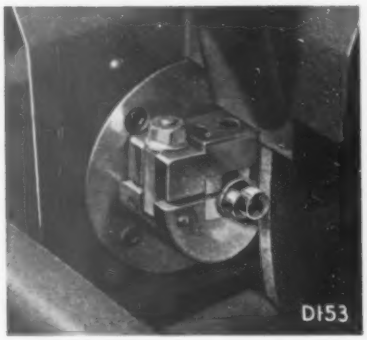
To Finish The Job Quicker . . .



D-150:—Standard Landis 6"x 18" Type C Plain Grinder . . . between center grinding an arm rotary shaft.



D-154:—Same machine . . . special live spindle headstock . . . grinding the eccentric of a hook.



D-153:—Same machine . . . same headstock . . . different (indexing) chuck . . . grinding 2 eccentrics of a main shaft.

USE TWO HEADS INSTEAD OF ONE

. . LIKE THIS . .

The Landis 6"x18" Type C Plain Hydraulic Grinder. This high production grinder is being used for the grinding of 3 different parts.

A certain manufacturer wanted to grind 3 totally unlike parts on the same machine at a high rate of production. This is what he did.

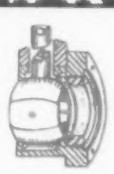
First, he installed a Landis 6"x 18" Type C Plain Hydraulic Grinder. On it such parts as arm rotary shafts (D-150) are ground between centers, using the standard dead spindle headstock. Then a special live spindle headstock is placed on the work table to the right of the standard head. With the aid of a chuck the eccentric of a hook (D-154) is ground. By merely changing to a second indexing chuck and using the same special head 2 eccentrics of a main shaft (D-153) can also be ground.

This combination of a standard high production grinder plus proper additional equipment saves valuable time. Can't you benefit by something similar?

Unusual Performance As Usual

PRECISION LANDIS GRINDERS

LANDIS TOOL CO. WAYNESBORO, PENNSYLVANIA.



MICROSPHERE WHEEL SPINDLE BEARINGS

MULTI-SPEED HYDRAULIC TABLE TRAVERSAL

HYDRAULIC STRAIGHT INFEED

393

A. S. T. E. DOINGS . . . . . .

By IRWIN F. HOLLAND

Providence, R. I. on March 19th, was the scene of the chartering of "Little Rhody" chapter, A.S.T.E. Shown above, l. to r. Ed. J. Berry, tool supervisor, Universal Winding Co., chairman. Geo. H. Nye, President Circular Tool Co., first Vice Chairman. John E. Mac Arthur, second Vice Chairman, Works Manager, Hemphill Co., and Frank W. Curtis, President A.S.T.E.

Binghamton

The Binghamton Chapter held its regular meeting on Feb. 4 at the Arlington Hotel, Binghamton. 89 members and guests gathered at 7 p.m. in the Colonial Room for dinner, during which numerous selections were rendered by Bob Gleason's cowboy band. Meeting was opened at 8:30 by Chairman Lenox who introduced Mr. Herto Cooke of the American Locomotive Company, Diesel Engine Division, Auburn, N. Y. The subject "Modern Diesel Engines" was very thoroughly presented, starting with a biography of Rudolph Diesel, the inventor, and covered the history of development to the present time.

Election of officers took place; the results being: Chairman, Warren E. Kishbaugh; 1st Vice-Chairman, Jasper Mazar; 2nd Vice-Chairman, Richard Riker, Jr.; Treasurer, Harold Taffe; Secretary, Stanley Bishop.

Boston

The March meeting of the Boston Chapter was held on the 19th at the Hotel Lenox, Boston. Principal speaker was Ernest V. Flanders, Manager of the Thread Grinding Department of Jones & Lamson Machine Company, Springfield, Vermont.

The meeting was high lighted by the induction of new officers—J. W. Geddes, Chairman; Warren Ames, First Vice-Chairman; Henry J. Richards, Second Vice-Chairman; W. D. Roderick; Treasurer and E. W. Vansaw, Secretary.

Henry Richards introduced an innovation with Technicolor sound films. The Chapter's new Chairman, Jack Geddes, was back on the job after a long illness.

Buffalo

Buffalo Niagara Frontier Chapter held its annual election of officers at the monthly meeting, Thursday, Feb. 19, at the University Club. Dinner preceded this meeting which was called to order by Chairman, Allen Siegel.

Reports were made by the various committee chairmen. Mr. Wm. Gamble, Chairman of the Membership Committee, reported that the Chapter membership was almost doubled in 1941 and was in fifth place for membership gain.

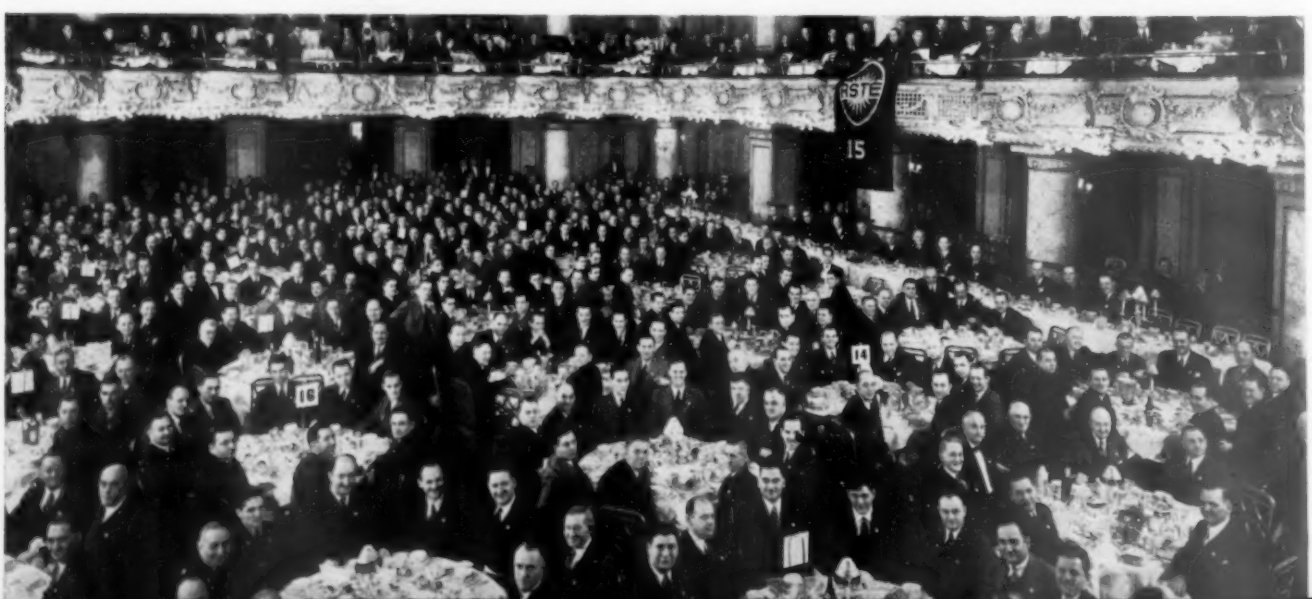
The election of officers then took place with the following men voted into office for 1942: Chairman, William Gamble; First Vice-Chairman, Frank Schwenzer; Second Vice-Chairman, Frank Wilson; Secretary, F. S. McCoy; Treasurer, A. Kirchgessner.

The Chapter held its Fifth Annual Dinner Dance at the Trap and Field Club, Valentine Night, Saturday, February 14. The party was a complete success with over three hundred attending. Dancing was from 9:30 P.M. to 2:30 A.M. to Jack Valentine's Orchestra. Dinner was served at 12 Midnight.

Chicago

The Chicago Chapter held its monthly meeting at the Midwest Athletic Club, Chicago, on March 2. This meeting was a Smorgasbord and Smoker held with the idea of spending a social evening and having their membership

Philadelphia chapter, A.S.T.E. passed another milestone with its fourth annual dinner, shown below. Many dignitaries and well known Tool Engineers were in attendance from far and near, including Col. J. Kirk, in charge small arms, Frankford Arsenal, Col. J. E. Brown, Com. Officer Delaware Ordnance depot. J. J. Buckley and J. J. Barnickel of Baltimore and Mr. Helt—one of two living men, who accompanied Commodore Perry to the North Pole.



Announcing...

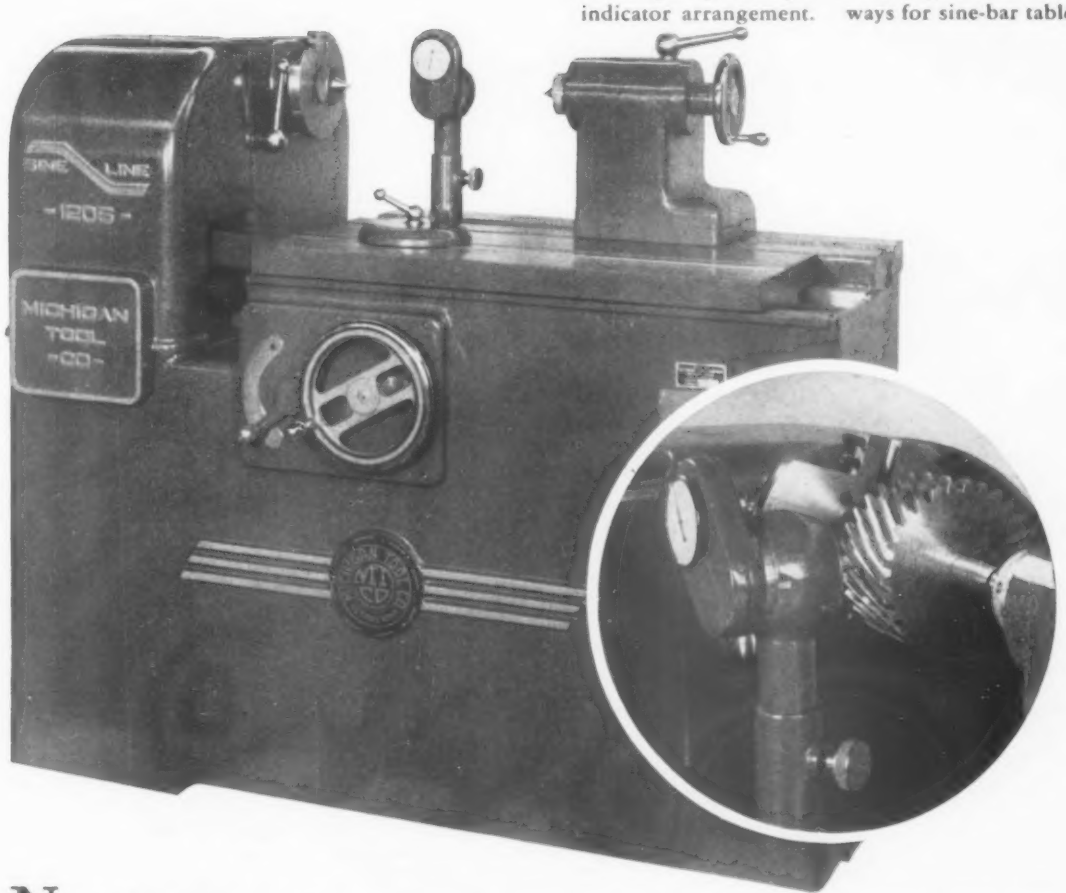
LEADS *from* ZERO *to* INFINITY

1 UNIVERSAL—no master rolls or discs or lead screw required.

2 CONVENIENT—all adjustments at working height. Simple indicator arrangement.

3 FAST—saves time in setup and checking of gears.

4 ACCURATE—Maximum rigidity. Narrow guides and wide ways for sine-bar table.



NOW ADDED to *Michigan* "Sine-Line" gear checking equipment is the new model No. 1205, a lead checker that will handle gears with leads from zero to infinity. Universal and flexible, it has been designed for maximum accuracy and speed in production and laboratory checking of gears.

Convenient to set up, all adjustments are at 'working' height while sine-bar setting can be checked with either gage blocks or micrometer. The indicator arrangement is extremely simple and easy to swing into contact, saving time in gear checking. The No. 1205, like other *Michigan* "Sine-Line" gear checkers, is designed for use, if desired, in combination with the *Michigan* gear-checking recorder unit.

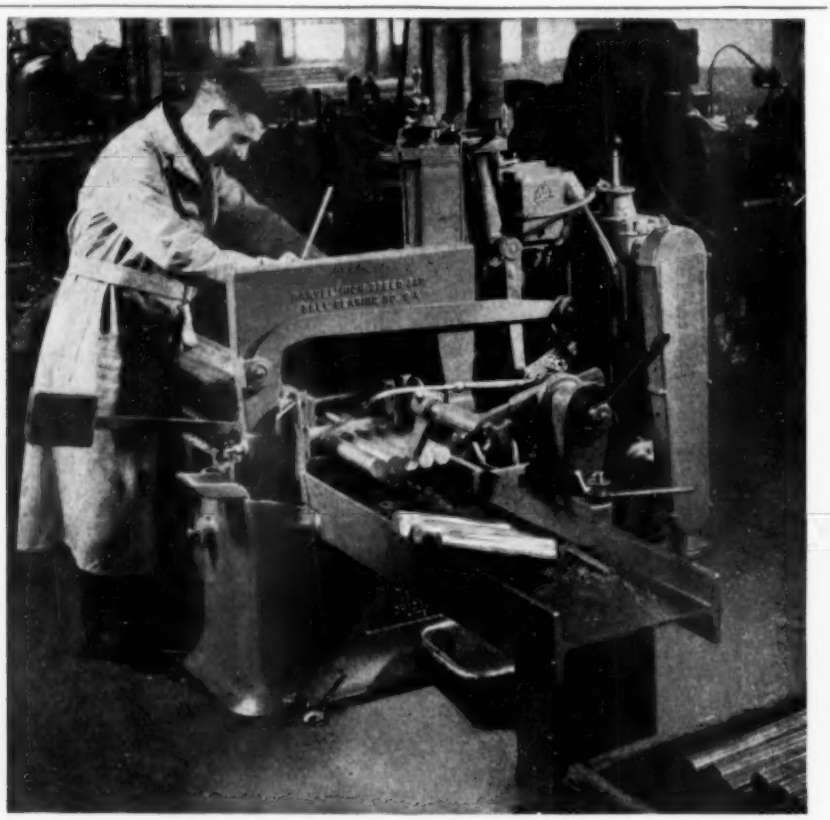
We will be glad to send you complete information. Ask for Bulletin No. 1205-42.

MICHIGAN TOOL
7171 E. McNichols *Company* Detroit, U. S. A.

and guests get better acquainted with one another. A number of educational exhibits of table size were displayed with no cost to the exhibitor. Members were encouraged to display any special parts they had designed for manufacturers. Members and guests began arriving at 6 p.m., and from that time until 8:30 p.m. they viewed exhibits and enjoyed a Smorgasbord with beer.

Mr. Goransson then introduced Mr. Armstrong, Chairman of the Local membership Committee, who made a few remarks. At 8:45 the radio program, featuring Donald Nelson, was tuned in. At 9 p.m. Chairman Goransson introduced Paul Harris of the Paul Harris Production, who showed a talking film entitled, "Spoilage in Production." After Mr. Harris' remarks, Mr. Goransson introduced Mr. George Sauer, of the Development Department of the Union Special Machine Company of Chicago, who showed some very interesting motion pictures of fishing trips he had taken in Wisconsin, and also deep sea fishing.

Southern Connecticut Chapter of A.S.T.E. held its first Annual Executives' Night with many Executives and Engineers attending. Honor guests shown above, left to right are: Frank W. Curtis, National President, A.S.T.E., M. F. Judkins, Chief Engineer, Firth-Sterling Steel Company, A. H. d'Arcambal, Toastmaster, sponsor for New Haven Chapter, Major W. H. Weinger, Hartford Ordnance District, coffee speaker, Henry J. Ballemore, Chairman of New Haven Chapter, R. H. Morris, 2nd Vice President, A.S.T.E., H. E. Chellis, Vice Chairman, New Haven Chapter, Lt. H. Ross (foreground) Hartford Ordnance District.



MARVEL 9A (capacity 10" x 10") Cutting-off shafts at the Monarch Machine Tool Co.

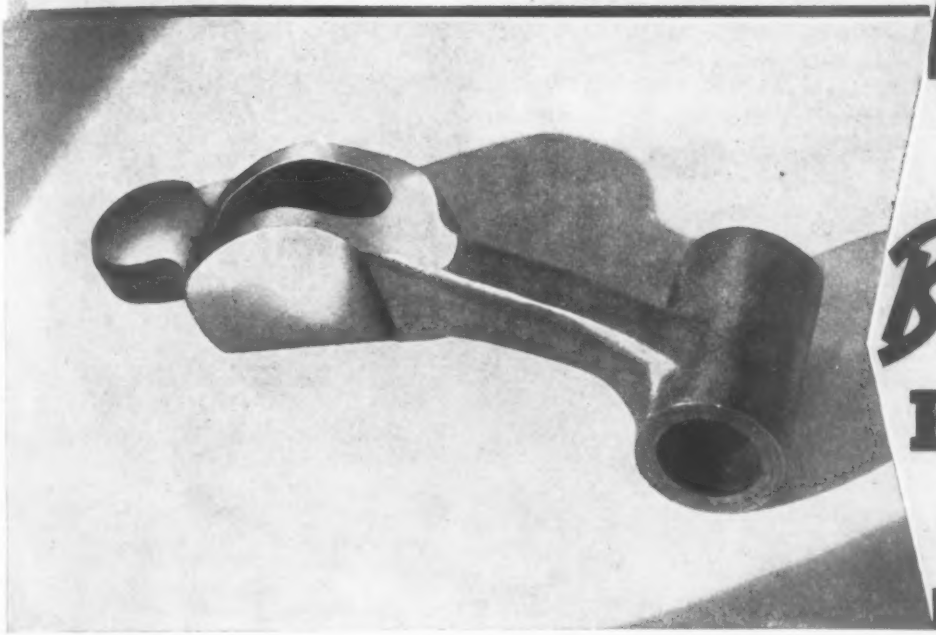
Four of Boston's new officers: Front row l. to r. Warren Ames, 1st Vice Chmn. Henry Richards, 2nd Vice Chmn. Standing: l. to r. E. E. Vansaw, Secretary, and W. D. Rodrick, treasurer. John W. Geddes, Chapter Chairman was absent because of illness.

Cleveland

At the March 13th meeting of the Cleveland Chapter, Chairman C. V. Briner reported that the Chapter as a whole was in a much stronger financial condition than it ever has been before.

Guest speaker of the evening was Lt. D. R. Imhoff, who heads the Machine Tool Division of the Cleveland Ordnance District. Lt. Imhoff said that the job of the Machine Tool Division of the Cleveland Ordnance District was the procuring of guns and ammunition for this war. The Machine Tool Division of the Cleveland Ordnance District attempts to see that the machine tools get to the contractors when they are needed.

In the Heart of a TORPEDO BOAT



is this *Broached* ROCKER ARM

24 HOURS A DAY

. . . seven days a week of full shift production makes possible continual operation of every machine in the Detroit Broach plant. This will continue for the duration.

In the production of boats, aircraft, shells, tanks, and almost every other implement of modern warfare, Detroit Broaches are being used. They can aid in stepping up the speed and accuracy of many of your present metal-cutting operations.

A current expansion program will result in our capacity being increased considerably. We will continue to meet all broach requirements of our customers engaged in armament production.

DETROIT BROACH COMPANY
20201 SHERWOOD AVENUE • DETROIT, MICHIGAN

Those tools are chosen that can be used to the best advantage. That in itself is a tremendous job which will certainly call for some help from the Society of Tool Engineers. The Machine Tool Division of the Cleveland Ordnance District has the problem of seeing that machine tools are obtained for the contracts in this district. That today is a task which, from the machine tool builders' standpoint, is totally inadequate. They cannot make the deliveries required. A number of things will have to be done. Operations will have to be simplified. It will be necessary to tear down to individual operations. Used tools will have to be found that will do the job. A way must be found to bring those tools out of the plants where they are no longer required for operations and put them to work to accomplish the colossal task laid out. Appeals will have to be made in many ways to do this.

Following the installation of new officers elected at the February meeting, the new Chairman of the Cleveland Chapter, Chas. W. Scheihing, announced the appointment of the following committee chairmen: Meetings: Wm. Reiff, Jr. (Cleveland Duplex Mchry. Co.). Industrial Relations: Walter Wyatt (Wyatt Sales Co.). Entertainment: J. R. Fitzsimmons (Die Supply Co.). Publicity: Ed. Baumgardner (National Carbon Co.). Membership: Karl H. Meyer (Reliance Electric & Engr. Co.). Editorial: Ed. Baumgardner (National Carbon Co.). Standards: Henry W. Sauer (Black & Decker Co.). Constitution & By-Laws: Frank Denning (Denning Mfg. Co.). Education: Roy E. Bender (Thompson Products, Inc.). Emergency Defense Training: Chas. W. Scheihing (Natl. Carbon Co.). Tool Advisory Committee to Cleveland Technical Soc.: J. K. Fitzgerald (Niagara Machine & Tool Co.). Reception Committee: Price Drummond.

Dayton

The Dayton Chapter met at the Hotel Gibbons on March 9. Mr. M. F. Judkins, Chief Engr. of the Firthite Division of the Firth Sterling Steel Company, gave an excellent talk accompanied by films on "The Use and Manufacture of Carbide Tools."

The meeting was well attended, and the discussion which followed Mr. Judkins' presentation of the subject was highly instructive, and indicated a growing interest among Tool Engineers in the application of Carbide Tools. The retiring officers were Cocktail Hosts for the meeting.

Fond du Lac

The Fond du Lac Chapter held its March meeting, 13th, at the Retlaw Hotel, Fond du Lac, Wisconsin. Dinner was served at 6:30 P.M. to a large gathering of members and visitors from the Fox River Valley area. The visitors included representatives of industry from Neenah, Brillion, New Holstein, Appleton, Oshkosh, Green Bay, Sheboygan, Oakfield and Fond du Lac; also A.S.T.E. members from Milwaukee attended the meeting.

After dinner, a sound motion picture film was presented by C. T. Engman, representative, of the Carborundum Co., called "Jewels of Industry." This, together with the speaker's preliminary discussion, featured the manufacture, application and uses of abrasives.

Three new Chapter members were introduced and welcomed at the meeting.

Tentative plans were arranged to hold a joint meeting on April 10 with the Engineers' Club of Kimberly-Clark Company in Neenah, Wis. The subject of this meeting discussion will be "Defense Training in War Industries."

Western Michigan (Grand Rapids)

After a short business meeting, the main speaker of the evening was presented, Mr. E. W. P. Smith, welding specialist and consulting engineer for the Lincoln Electric Company. Mr.

Smith is touring the country addressing groups of engineers, technicians and production men on the welding speed up. His talk was on welded jigs and fixtures, also regarding production welding, how one third in time and 17 per cent in weight can be saved in construction by arc welding. A demonstration of stresses shown with plastic models and polarized light was shown by use of a projector and slides. After finishing his lecture, several questions were asked regarding welding strains and methods. The meeting was closed after an announcement regarding the April meeting which will be held in Kalamazoo. The speaker will be Mr. Linsley of the Wright Aeronautical Corporation.

Hamilton, Ontario

The February meeting of the Hamilton Ontario Chapter was held at the Royal Connaught Hotel on February 12, and was called Executive Night. A large number of industrial executives from the Hamilton district were present as guests and Mr. Frank W. Curtis, President of the A.S.T.E., was the principal speaker of the evening.

The following officers were elected for office for 1942-3: Chairman, C. Fisher; 1st Vice-Chairman, J. Little; 2nd Vice-Chairman, S. Myers; Secretary, E. Greer; Treasurer, H. Coit.

Mr. Curtis was introduced by Mr. Norman Finlayson, Vice-President of the John Bertram Company. Mr. Curtis commenced his address by giving a brief outline of the founding and growth of the A.S.T.E. His lecture was on Tool Engineering and was illustrated with lantern slides.

Hartford

Hartford Chapter held its regular monthly meeting for March on the second of the month with dinner at the Hartford City Club at 6:15 P.M. The dinner was a purely social affair with no speakers except the usual banter from the floor.

The speaker of the evening was introduced by Clayton S. Parsons, incoming Secretary, who gave a very interesting biography of the speaker's experience.

The topic of the evening was "Bearings for Defense," and was ably covered by Mr. Lester A. Lanning, Assistant Plant Mgr. of Bristol Plant, New Departure Division of General Motors Corporation. Needless to say, there were many things that the speaker would like to have told us that he could not tell since December 7th. The talk as originally scheduled last year would have probably been more inclusive, but it was very good as it was. He explained in a general way the number of bearings going into the modern mechanized army and how it must depend on anti-friction bearings for its ability to maneuver rapidly and keep going.

Detroit Chapter's March meeting was pleasantly surprised by a visit from several Texas Tool Engineers, shown above.

Twin Cities (Minneapolis-St. Paul)

The Twin Cities Chapter held its regular meeting at the Dunwoody Institute on Feb. 18. Twenty-two members attended the dinner, which was in cafeteria style. After this, the group discussed the election of officers for the next year, but as the nominating committee had not prepared a list of nomi-

nees, election was held over until next month. Mr. Winter, First Vice President of the A.S.T.E. then gave a little pep talk. Mr. Dean Schweichard, Ass't. Supt. of the Minneapolis Public Schools, gave a talk also, entitled "The Part Vocational Schools Play in Defense Training," which was most interesting.

Montreal

The Montreal Chapter No. 50, was chartered on Saturday, Feb. 14. The meeting was held at the Ritz-Carlton Hotel, Montreal, and about 100 attended the meeting, and the Chapter organized with 70 charter members. Mr. Arnold Thompson, Dean of the Canadian A.S.T.E. activities and also Past Chairman, Toronto Chapter, opened the meeting, and after a few remarks proceeded with the election of officers, which resulted as follows: Chairman, J. Hall, Gen. Tool Room Foreman, Canadian Pacific Railway, Augus Shop, Montreal; 1st Vice-Chairman, J. M. Davis, Supt. Defense Ltd., Montreal; 2nd Vice-Chairman, Roger B. Douglas, Ass't. Supt., Propeller Division, Canadian Car and Foundry, Montreal; Secretary, Herbert Gibson, Department Munitions Supply, Montreal and Treasurer, E. Kingland.

Southern Connecticut (New Haven)

The first annual Executives' Night of the Southern Connecticut Chapter was held on February 24 at the Hotel Garde, New Haven, Conn., with an attendance of nearly 170, including executives and engineers from various manufacturing plants from the southern sector of the state.

At the technical session, the principal speaker was Malcolm F. Judkins, Chief Engr. of the Firth Sterling Steel Company. His subject was entitled "Manufacturing and Use of Sintered Carbide Cutting Tools." Explaining that "This is not so much a war of men, but a battle of machinery and a war on production," Mr. Judkins stressed the importance of rapid production which may in turn "help our boys who are fighting."

Other guests of honor were: Walter Pohl, Vice-Pres. Waterbury Tool Co.; Frank Smith, Sargent Company; Mr. Newton of W.P.B. for New Haven; Mr. Blakeslee of W.P.B. for New Haven; Prof. Phillips of Yale University; George Stephens Hoggins Pettis Company; and Andrew Schoefler, Supt. of Sargent Company.

Particular credit for this largest meeting goes to Henry Bellemore, Andy Schoefler, and Fred Dawless.

Greater New York (New York)

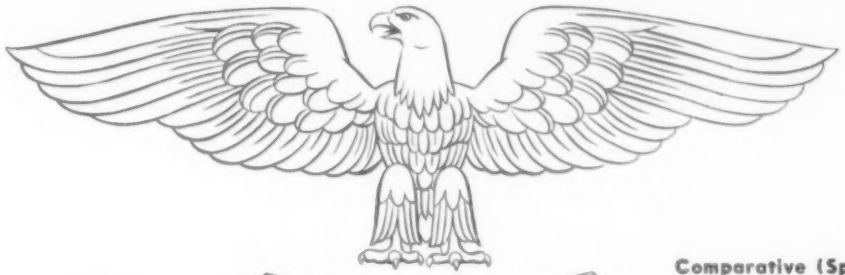
Greater New York Chapter held its monthly meeting on March 2 at the Hotel New Yorker.

Mr. Orchard explained to the Members that the official installation of the newly elected officers would take place on April 6, 1942, Ray Morris, 2nd National Vice-President officiating.

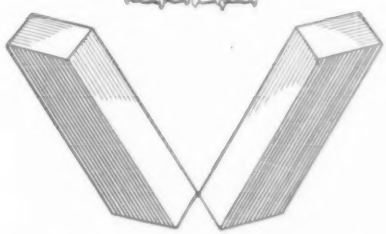
Mr. J. J. Hogan, the Chapter's newly elected Chairman, was introduced, and he proceeded to take over the meeting. After a brief introductory message to the members, Mr. Hogan presented a handsome travelling bag to their retiring chairman as a small token of the esteem and appreciation which was unanimously felt for his arduous and unceasing effort in fostering the first trying years of their Chapter.

The newly elected officers were then officially introduced to the membership, who were as follows: 1st Vice-Chairman, J. Spaulding; 2nd Vice-Chairman, W. Cortlyn Rhodes; Treasurer, W. Nardo; Secretary, J. D. Schiller.

The speaker of the evening was Mr. McKenna of McKenna Metals Company. A very interesting lecture of the manufacture and uses of cemented carbides followed amply illustrated.



Cutting properties are equal to the 18-4-1 Tungsten and 1½-4-1-8.80 Molybdenum types and it is recommended for any purpose where the other grades are generally used.



Comparative (Speed Increment) Cutting Tests

Grade	Cutting Speed Ft./Min.
Braemow	136.00
18-4-1 (Tungsten type)	132.00
1½-4-1-8.80 (Molybdenum type)	132.00

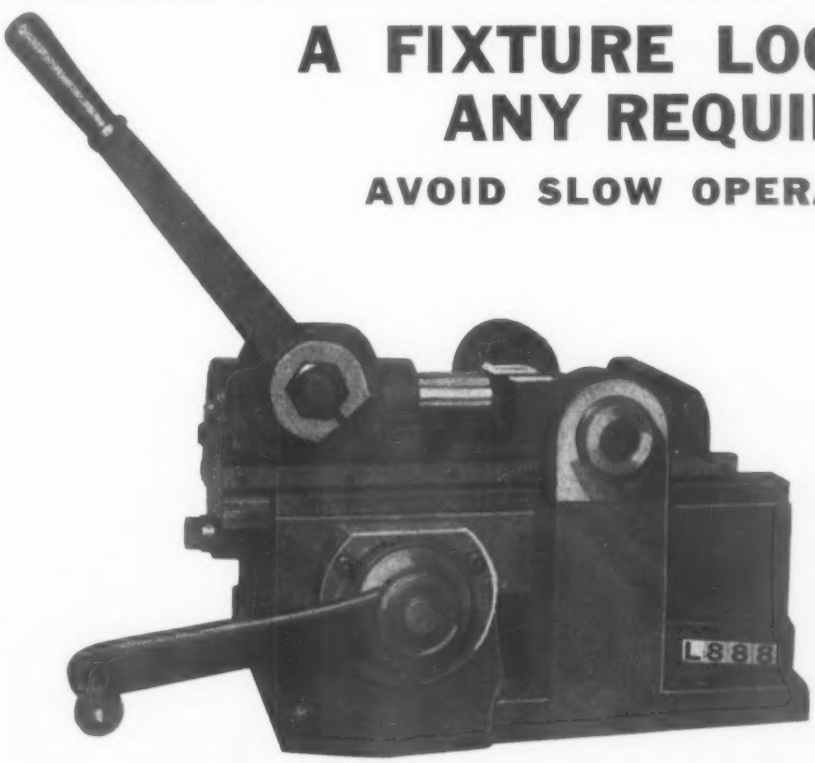
"Keep 'em Cutting"

"BRAEMOW"

HIGH SPEED STEEL

BRAEBURN ALLOY STEEL CORPORATION

BRAEBURN **PENNA.**



A FIXTURE LOCK TO SUIT ANY REQUIREMENT

AVOID SLOW OPERATING CLAMPS

Both Single and Double Action Locks are used in this Tooling.

The Single Action Lock Clamps the part, while the Lower or Double Action Lock securely holds the Movable Carriage in the desired position against stops.

SWARTZ TOOL PRODUCTS CO., INC.

13330 Foley Ave. **ASK FOR CATALOG 941** **Detroit, Michigan**

Peoria

The Peoria Chapter had an attendance of approximately one hundred twenty-five for the March 3 meeting — for what turned out to be a season's highlight.

Mr. T. B. Buell, Sales Manager of the Sundstrand Machine Tool Company was the speaker of the evening. He spoke on "Shell Turning." The Sundstrand Company has adapted its standard automatic lathe to the special task of turning, facing, boring, and centering shells. Mr. Buell showed how these machines are tooled and how they operate by first showing a slide of a diagramatic sketch of the tooling set up and then showing a movie of the actual operation. Throughout his entire talk, Mr. Buell alternated from slides to movies. Everyone present obtained a very clear conception of the tooling by this method of presentation. The meeting closed with a color movie on the design and firepower of the Airacobra fighting plane provided by the Bell Aircraft Company. This film was a fitting climax to a top notch program and made those present glad that these fighters are fighting on our side.

Philadelphia

Another milestone has just been turned by the Phila. Chapter No. 15, as they celebrated their Fourth Anniversary Dinner and Gala show at the Bellevue Stratford Hotel, in Philadelphia, February 28, 1942.

A group of more than 825 members and friends enjoyed this grand affair. Chapter Chairman, John A. McMonagle, who carried on a splendid year, opened the meeting after a full course turkey dinner by welcoming everybody to this festive affair and after thanking all his officers and committee chairmen for their whole-hearted cooperation during the past year, then introduced the new officers who will take the reins for the coming year. Namely: Charles Crook, Jr., Chairman; Fred L. Creagor, 1st Vice-Chairman; Henry L. Simpson, 2nd Vice-Chairman; Foster M. Crayton, Secretary and Howard W. Gross, Treasurer.

Chairman Frankfurter introduced the main speaker, Colonel J. Kirk, Officer in Charge of the Small Arms Dept. of the Frankford Arsenal and second in command at this post.

Colonel Kirk gave the boys an excellent talk on the importance of the Tool Engineer's Job during this emergency and wished to express his sincere thanks for the splendid cooperation they were giving him at the Arsenal and also expressed the belief that our organization was one of the most important branches of the defense industry and wished the Tool Engineers many years of success.

Colonel J. E. Brown, Commanding Officer, Delaware Ordnance Depot, was then introduced and also the following officers and noted guests that were present: Major Stone, Captain H. A. Harris, from Del. Ordn. Depot, Captain Vernon, Phila. Dist. Ordn., Lieutenants. Glueck, Ford, and McMullen, Ivan Grass, Chairman of Central Penna. Chapter No. 22, and G. F. Steiner, Chairman of Baltimore Chapter, with two of his side-kicks were also present, namely, J. J. Buckley and J. J. Barnickel, and many other noted guests; such as Mr. Heit; who is one of the only two men living that accompanied Commodore Perry to the North Pole and a rousing cheer of welcome was given Mr. Heit.

Pittsburgh

The March meeting of the Pittsburgh Chapter was held at the Fort Pitt Hotel in Pittsburgh on Friday Evening, March 6. The dinner was a homecoming welcome to Frank W. Curtis formerly located in Pittsburgh and one of the original co-founders of their local Chapter.

After a better than usual dinner, enjoyed by 109 members and guests, a short business meeting was held. Mr. Ford then introduced Mr. Frank Curtis, and the entire group became electrified, and Mr. Curtis received a wild acclaim. Mr. Curtis told of the progress of the Tool Engineers and spoke briefly on his travels. Mr. Curtis then installed the 1942-43 officers in regular form.

Mr. Ford then raffled off a radio, which was won by Mr. Arthur Murray. After a slight recess, Mr. Curtis, spoke on "Tool Engineering and the Design of Jigs and Fixtures." Mr. Curtis was thoughtful enough to have had prepared a printed and illustrated copy of it for his listeners which he made available to all present.

Portland, Maine

Portland Chapter held its second meeting of the year on Friday evening, February 13, at the Hotel Lafayette. Election of officers took place. Officers elected for 1942 are: Chairman, Ned Andrews; Vice-Chairman, Joe Perry; Treasurer, Calvin Fickett; Secretary, Charles E. Paige.

After the business meeting, the Chairman introduced Mr. A. A. Companion of the Crucible Steel Company, who gave a very interesting talk on the "Manufacture and Use of Crucible Steel in Production Today." A question and answer period was held.

Providence

A new Chapter of the A.S.T.E. was chartered in the Providence area, Thursday, March 19. Frank W. Curtis, President, and Ray H. Morris, 2nd Vice-President, conducted the meeting, which included dinner at the University Club, which in turn was attended by more than sixty members and guests.

The officers elected were: Chairman, Edward J. Berry, Tool Supervisor, Universal Winding Company; 1st Vice-Chairman, George H. Nye, President, Circular Tool Co.; 2nd Vice-Chairman, John E. MacArthur, Works Mgr. Hemphill Co.; Treasurer, Albert W. Rogers, Production Control Engr., Universal Winding Co.; Secretary, Earl R. Phinney, Design Engr., Taft-Peirce Mfg. Co.

After the officers had been inducted, Chairman Berry opened the meeting to a discussion on a suitable name for this chapter, and after a short debate it was unanimously voted to adopt the name of "Little Rhody Chapter, No. 53".

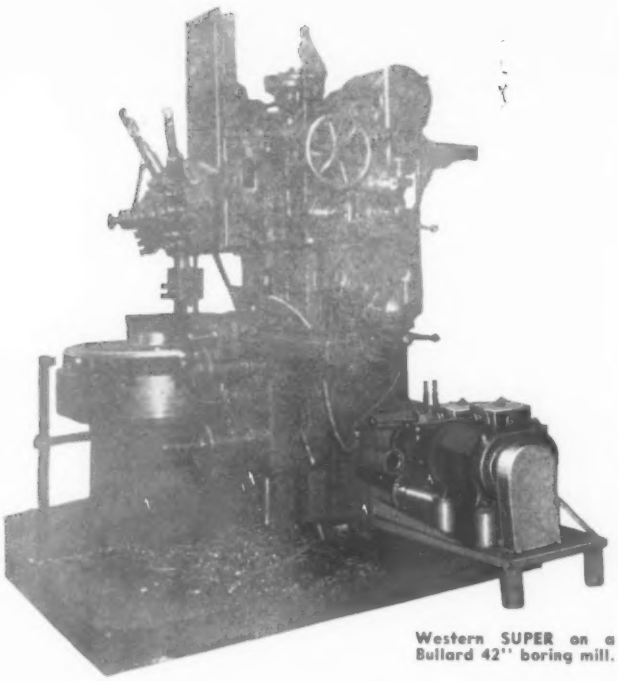
The Charter group included 45 new members, and the inclusion of three members now at large, as well as approximately 10 transfers from the Worcester and Boston Chapters. The first regular meeting was planned for Monday, April 6.

Rochester

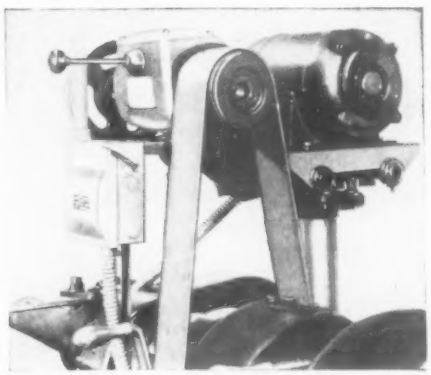
On Wednesday, March 11, between 75 and 100 members met at the Hotel Sagamore for the regular March meeting. Chairman C. E. Lucas called for the annual report of Secretary Milton Roessel who gave a comprehensive report of the Society's present status. It was interesting to note that the membership had increased approximately 30% during the year. Another important and interesting fact was that the Treasury was in a very healthy condition.

Bob Barnett, appointed as head teller, reported the results of the balloting for the new officers. Elected for Chairman was Cliff Sears. For First Vice-Chairman was Joe H. Schick; Second Vice-Chairman, Chauncey G. Newton; and Third Vice-Chairman, Joe S. Gray; Treasurer, Fred E. Bittner; and Secretary, Milton L. Roessel. Four new faces will appear on the Board of Directors, who are as follows: Earl DeBischop, Herbert Simon, Bernard E. Williams, and Louis C. Petz.

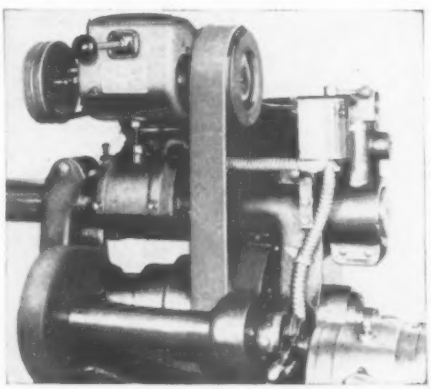
After the new officers and directors were put on review for the membership



Western SUPER on a Bullard 42" boring mill.



Western MASTER (1-5 h.p.) on a Warner-Swasey turret lathe.



Western MASTER (1-5 h.p.) on a Cincinnati No. 2 milling machine.

WESTERN TRANSMISSIONS

A MASTER capacity (1-5 h.p.); A MAJOR capacity (5-10 h.p.) and A SUPER (up to 30 h.p.) can be installed on shapers, radials, slotters, boring mills, gear cutters, die sinkers, etc. Transmission case and cover are of semi-steel castings and are oil-leak proof. The gears and splined shaft are of alloy steel, accurately machined, heat treated and ground—the gears are lapped. Standard bracket for transmission and motor mounting is furnished and also an adjusting belt.

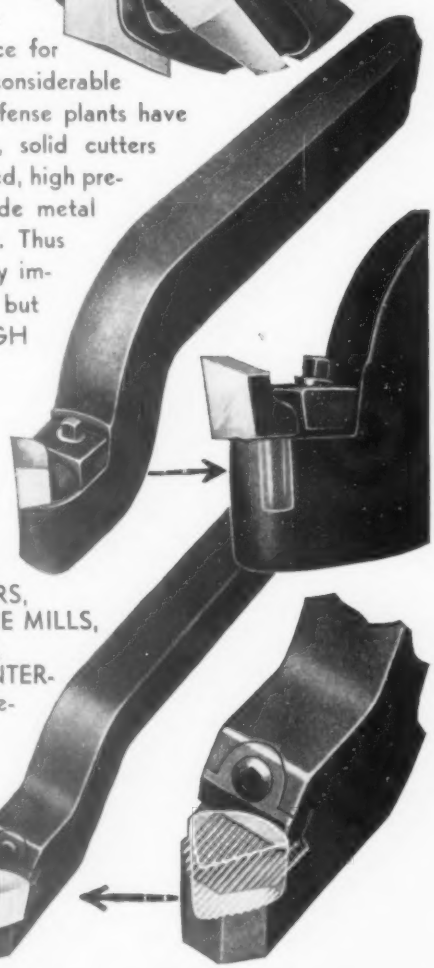
Prompt deliveries on high priorities.

WESTERN MANUFACTURING COMPANY

3406 Scotten Ave. Detroit, Michigan

THESE MODERN TOOLS ARE BUSY MAKING MODERN WEAPONS

Realizing that Time makes no allowance for a faulty set-up, a considerable percent of the Defense plants have replaced old-style, solid cutters with O K high speed, high precision inserted-blade metal cutting equipment. Thus they have not only improved production but CONSERVED HIGH SPEED STEEL.



Available in—
MILLING CUTTERS, END MILLS, FACE MILLS, BORING HEADS, REAMERS, COUNTER-BORES, and single-point tools for LATHES, SHAPERS, PLANERS, etc.

THE O K TOOL CO., SHELTON, CONN.

Originators & Sole Manufacturers of the

TRADE O K MARK **SYSTEM**

OF INSERTED-BLADE METAL CUTTING TOOLS

by New Chairman Sears, the meeting was turned over to W. Reuen Fisher of the Universal Engineering Company of Frankenmuth, Michigan. Mr. Fisher, a big game, mountain climbing photographer, who, when not traveling with his camera, manufactures drill bushings. Mr. Fisher took over the show. Thousands of feet of Kodachrome movie film of Canada's North West Rocky Mountains were shown. The photography was magnificent and outstanding because of the splendid editing of the film itself. Much interesting wild life was shown by the way of telephoto lens and also close-ups.

Rockford

Rockford Chapter held its March meeting at Hotel Faust on the 5th. A real treat was in store for the 150 members attending this meeting. First, the after-dinner speaker, Mr. J. G. Gilbert Lodge, Governing Director of Gilbert Lodge Company Ltd., Australia. Mr. Lodge is the only A.S.T.E. member in Australia and he presented a very interesting outline on conditions of Germany and Japan before and immediately after War No. 2 was underway. Mr. Lodge was in Czechoslovakia at the time Germany started their invasion of that country. He related several interesting experiences and how well the German Army was mechanized. Also, he pointed out the treaty which France had with Russia on mutual aid if Czechoslovakia was invaded. Of course, France entirely disregarded this treaty since they did not feel they were prepared to fulfill their obligations.

During his visit to Japan before they entered the war, Mr. Lodge was able to show how well Japan was prepared for their part in the war, and he pointed out very definitely that they should not be underestimated. He did, however, predict that Japan would be at the end of her resources by the end of this year.

In regard to Australia, Mr. Lodge told how they were contributing their share in the manufacture of munitions which not only took care of their own requirements but also are supplying Great Britain with huge quantities. Australia has made great strides in the manufacture of machine tools, mining, steel mills, and other related items. Mr. Lodge predicted that Australia would play a very important part in the Industrial field after the war.

Golden Gate (San Francisco)

The monthly meeting of the Golden Gate Chapter (San Francisco & Oakland) was held at Bellini's Cafe in Oakland, on March 10, and was attended by 86 members and guests.

Following dinner, a motion picture in technicolor and sound titled, "Unfinished Rainbows" was shown through the courtesy of the Aluminum Company of America. It was an authoritative historical picture about American resourcefulness in the development of aluminum, from its discovery, to present day universal use of the wonderful metal.

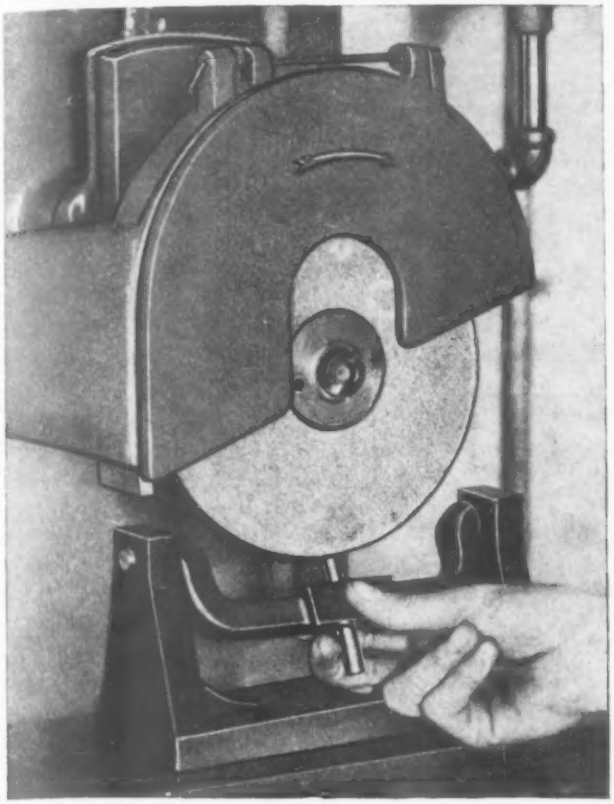
The technical session was in the nature of a "Forum on Tool Engineering" and each speaker was allowed ten minutes to present his paper on the subject, with a question period as the most important part of the meeting.

Mr. K. Bues, Chairman, introduced each speaker, and they were: J. Hahir, Plant Mgr., Schlage Lock Company, San Francisco, who spoke on "Plastic Forming and Draw Dies;" Mr. Harold Burlingame, Master Mechanic, Marchant Calculating Machine Company, Oakland, who spoke on "Automatic Screw Machine Tooling;" Mr. William Nahm, Plant Mgr., Remler of San Francisco, who spoke on "Molds for Plastics and Allied Materials;" Mr. Karl Bues, Supt. Tool Division, Marchant Calculating Machine Company, Oakland, who spoke on "Jigs and Fixtures."

Schenectady

There were 50 members and guests present at the dinner served at 7 p.m.

"Little Wonder" Radius Dresser Saves Time in Every Grinding Room

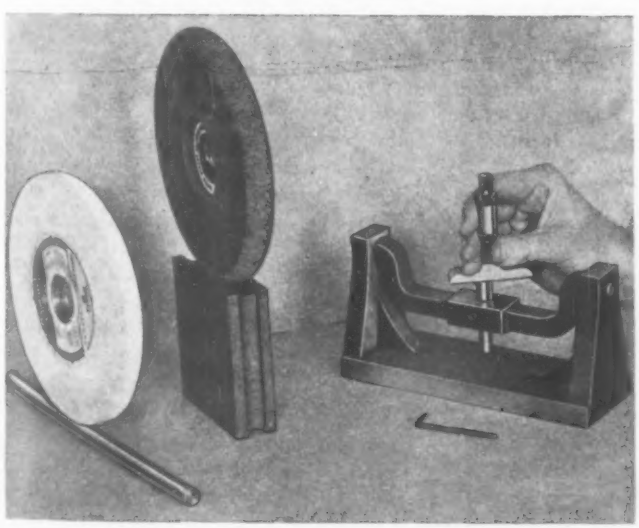


The "Little Wonder" Radius Dresser will dress radii from 0 to 1" quickly and conveniently. This is a time-saving device for every grinding room. May be simply and accurately set by micrometers or gage blocks. It does not contain bearings which may become clogged with emery. It will dress either convex or concave radii and is free from chatter.

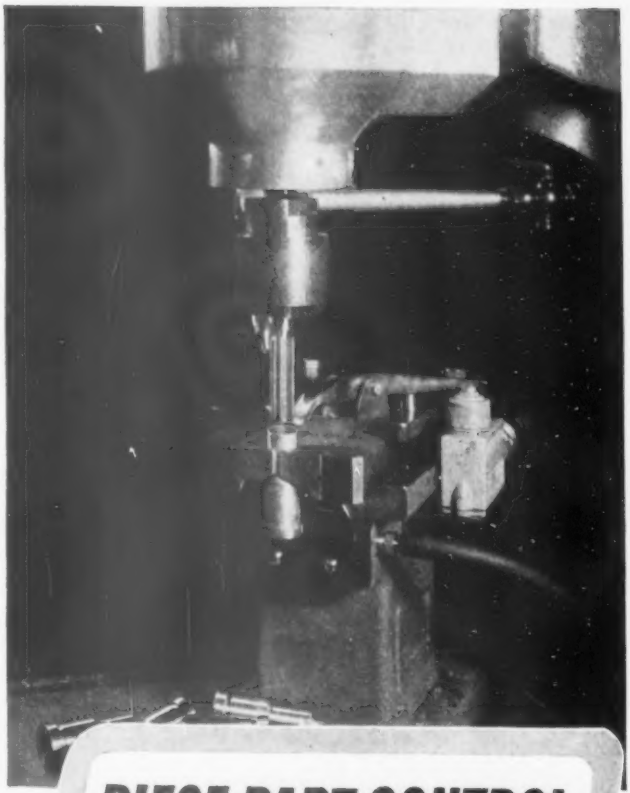
Price, Radius Dresser Only **$39.50**

Natural Pointed Coldset Diamond ⅓ carat $6.50

PLACE YOUR ORDER NOW SUBJECT TO APPROVAL AND ACTUAL TRIAL IN YOUR SHOP. WRITE, WIRE, or TELEPHONE CANAL 6-1464 FOR PROMPT SERVICE.

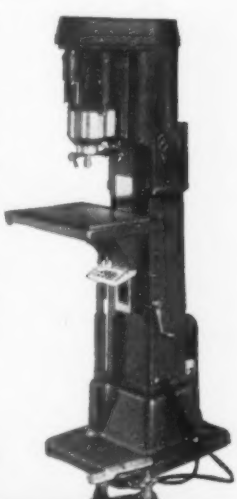


George Scherr Co., Inc. 132 Lafayette St. New York, N. Y.



PIECE PART CONTROL Helps You Control Costs

THIS Air Vise Fixture with Piece Part Control—a Haskins development—greatly speeds up the precision tapping of these time fuse bodies of cold rolled steel. The operator places the part in the fixture to start the tapping cycle and everything else is automatic—even the ejection of the tapped part!



Haskins developed fixtures are one important reason why Haskins Tappers are making such valuable contributions to war production now—and why these same *standard* machines can be so quickly and inexpensively converted to private industry production when Victory is won! R. G. Haskins Company, 2756 W. Flournoy St., Chicago.

NEW BOOKLET — *"Holding Fixtures for Haskins Tapping Machines"* — contains many new ideas. Send for a copy.

HASKINS

HASKINS *Precision* TAPPING EQUIPMENT

held at the Danish Hall, Schenectady, on March 12. After the business meeting, Mr. Crump introduced Mr. R. C. Neal, President of R. C. Neal Company, who gave a short after-dinner talk. Mr. Crump next introduced the speaker of the evening, Mr. W. R. Fisher, General Mgr. of Universal Engr. Company. Mr. Fisher showed the group two very excellent Kodachrome movies which were accompanied by music. Mr. Fisher acted as a narrator for his pictures. The first picture, entitled "Beyond the Brazeau", depicted a big game-hunting trip for Rocky Mountain sheep and goats in the Canadian Northwestern Rockies. The second picture portrayed an Alaskan fishing trip. Both pictures were very interesting and were excellent works of photography.

South Bend

South Bend Chapter held its March meeting at the Indiana Club and had a fairly good attendance, altho they believe that the overtime situation is cramping their style somewhat.

Mr. Otto W. Winter, 1st Vice-Pres. of A.S.T.E., was the speaker of the evening. His subject was "Russia's Background for the Present Crisis," which was most interesting. Mr. Winter also outlined the St. Louis Meeting for the benefit of the members.

Springfield, Mass.

The second annual joint meeting of the A.S.T.E. and A.S.M. was held at the Westinghouse Electric & Manufacturing Company Auditorium February 9. Frank W. Curtis, National President, presided as technical chairman. Dr. Koehling of the General Motors Corporation spoke on Powered Metallurgy. Many finished products made from power were on display, and Dr. Koehling presented the subject in a most interesting and constructive way. An interesting question period followed, indicating the general interest of the subject.

St. Louis

Long working hours and tired bodies did not affect the members' attendance at the March 12 meeting. This was the last meeting under the direction of the old officers and the Chapter is hopeful that the new officers will maintain the progress of the past year. The highlight of the business meeting was the 10th Annual Convention to be held in St. Louis on March 26, 27, and 28.

After the business meeting, the members adjourned to attend the annual meeting with the St. Louis Engineers Club. The speaker at this meeting was Mr. H. E. Linsley of the Wright Aeronautical Corporation. With the aid of sound pictures, he dealt with the processes involved in the production of Wright Aircraft engines, from the first operations in the foundry to final assembly and test.

Syracuse

Forty attended the dinner at 7 p.m. held in the Hiawatha Room, Onondaga Hotel, on March 10th. After dinner, Chairman Ray Adams, introduced several visitors from Oneida Community Limited.

Chairman Adams suggested that a committee be appointed to make a study of idle machines in their district and to find companies who were in need of such machines.

After the business meeting, Mr. H. P. Bentley, President of the Bentley Weldery Inc. of Syracuse, gave a talk on "Welded Construction for Jigs, Fixtures, and Machines," illustrated with lantern slides and blackboard sketches. Mr. Bentley, being a local man, was especially welcome at the meeting.

Toronto

The Ontario Chapter held its monthly meeting in the Oak Room, Union Station, Toronto on Feb. 13. There were ninety present for the dinner and about fifty-five came after dinner.

BELT MACHINING . . .
Helped This Small Manufacturer Get a DEFENSE CONTRACT

At one of the nation-wide Demonstration Clinics conducted by Porter-Cable, a man handed over a small part, to be ground ***dead parallel*** on both ends, for a close fit in an army tank. A large contract hinged on this one operation. "Holy Smokes, fellow, you've done it!" exclaimed the man when this ordinarily difficult job was done in a flash. Rushing home in a plane, he closed the contract and in a few days wired for a battery of Porter-Cable Wet-Dry Belt Grinders.

New Model G8

PORTER-CABLE

Wet-Dry BELT GRINDER

On almost any kind of material—hard or soft metals, alloys, stainless steel, plastics, hard rubber, glass—Porter-Cable ***Belt Machining*** is a revelation! This G-8 ***Wet-Dry*** model is more than "just another machine"—it makes possible a ***new process.***

Does the
PRECISION WORK
of a Major Machine
at the
LOW INVESTMENT
of a Belt Grinder!

It takes over many operations usually done by millers, planers, surface grinders, cutters—for it's not only 5 to 50 times faster, but it's also a ***precision*** machine tool, that holds tolerances as close as .0005". Operating WET, it prevents heating, warping, discoloring and keeps the belt clean of fill-up.

Yes, a demonstration of Porter-Cable wet-dry belt grinding is "new stuff" to a lot of production men . . . and very convincing. When may we demonstrate to YOU? Phone your local Porter-Cable representative, or write direct for details.

FREE!—third edition of "Wet-Dry Belt Grinding In the Spotlight," tells Where, When and How to use this new high-speed machining method. Send for your copy today!

PORTER - CABLE MACHINE CO.
1610-4 N. Salina St. Syracuse, N. Y.
Representatives in Principal Cities in U.S.A.

A BOON TO METAL WORKING INDUSTRIES FOR DE-BURRING AND FINISHING OPERATIONS

SAVES PRECIOUS TIME
QUICK, EASY, INEXPENSIVE TO USE FOR:

Aircraft Engines, Fuselages, Assemblies, Parts, Propellers, Instruments and Precision Work of All Types. Sheet Aluminum, Stainless Steel and Other Metals to be Spot Welded. Machine Guns, Rifles, Parts. Shell Cases. Tank Engines and Parts.

—and Countless Other Finishing and Polishing Requirements of War Industries

BRIGHTBOY is an elastic, rubber compound, impregnated with abrasive. Gives an entirely different finishing effect than a grind or a buff, with a minimum dimensional loss of material.

Made in blocks, sticks, tablets and rods for hand work; in wheels for use on portable and stationary power machinery, lathes, grinders, polishers and other automatic and semi-automatic machines. BRIGHTBOY finishes, polishes, removes burs, file digs, tool marks, heat marks; restores finish to metals; smooths and cleans soldered and welded joints.

Available to war industries through recognized mill supply jobbers. Write us direct for catalogs and prices if your jobber cannot supply you.

BRIGHTBOY INDUSTRIAL DIVISION
WELDON ROBERTS RUBBER CO., Newark, N. J., U. S. A.

WHEELS **TABLETS**
STICKS **BLOCKS**

WELDON ROBERTS
Brightboy
The ***SOFT RUBBER*** binder
CUSHIONS the abrasive

The minutes of the previous meeting were read and accepted. Following this the election of officers took place.

The result of the election being: Chairman, E. N. Wearn; 1st Vice-Chairman, F. Schytte; 2nd Vice-Chairman, J. McRae; Secretary, L. Singer and Treasurer, J. R. Bruce.

Mr. Frank Curtis, National President, spoke a few words on the Objects and Aims of the Tool Engineering Society, and what is being done today to meet these aims and objects. The speaker of the evening was Mr. Ben Berlein of the Lindberg Steel Treating Co. of Chicago, who spoke on Heat Treating Hints, and showed a most excellent film. He spoke chiefly, on the Hardening of tools and gages and fixtures.

Worcester

Another successful year is on the records for the Worcester Chapter No. 25 and the following men were installed by Bob Lippard for the coming year: Chairman, Mr. Leslie A. Goff; Vice-Chairman, Mr. Floyd H. Harris; Secretary, Mr. Harvey M. Allison and Treasurer, Mr. Herbert F. Ramsdell.

Mr. John Lindegren, retiring Chairman, presided and was presented a gavel donated by the Carboloy Company for the future use of the Society.

Mr. Lindegren made a special appeal to the members in an effort to make them realize that special effort should be made to send the Worcester Chapter over the top with a goal of three hundred members. Floyd Harris, Chairman of the Membership Committee, outlined a plan to be followed.

The meeting was then turned over to Les Goff, who introduced Mr. E. Van der Pyl, who is directly in charge of the Norbide and Diamond Wheel Division of the Norton Company. Mr. Van der Pyl gave a very interesting talk on Diamond Wheels and their development and use. Following Mr. Van der Pyl's talk was a lengthy discussion period during which all in attendance received a wealth of information which should be helpful in every walk a day life.

Williamsport

The Williamsport Chapter held its monthly meeting on March 9 at the American Legion Club. After dinner, a short business session was held during which the idea of having a card party was discussed.

A sound movie of the Carborundum Company—"The Story of the Service of Abrasives in Industry" was shown.

About eighty members attended the meeting.

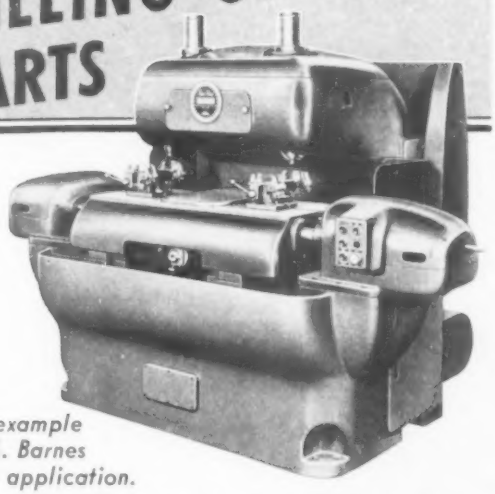
Louisville, Kentucky is newest chapter to be added to the growing role of A.S.T.E. chapters—No. 53. Kenneth C. Jasper and Past President Jas. R. Weaver were instrumental in getting the new group organized.

Central Pennsylvania (York)

About twenty-five members and guests enjoyed a dinner meeting held on March 10, with all the Chapter officers present. Immediately following the dinner, Mr. H. D. Jones, Chapter Chairman called the business meeting to order. Chairman Jones expressed his appreciation for the support that the members gave him during the past year; then installed the following new officers for the coming year: Chairman, Ivan Grass; First Vice-Chairman, Lloyd Fitch; Second Vice-Chairman, George Ryder; Secretary, Luther Loucks; Treasurer, M. Lloyd Fry. The new Chairman, Ivan Grass, then addressed the group and asked for continued cooperation.

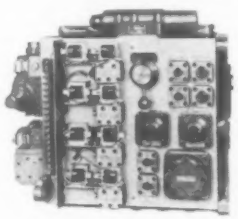
The speaker of the evening was Mr. Powers of the U. S. Tool Company. His subject was Multo-slide forming and punching and Multi-spindle milling, which was most interesting.

HYDRAULIC PROFILE MILLING OF GUN PARTS



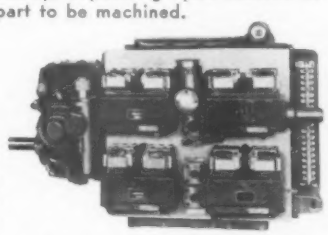
Another example of John S. Barnes hydraulic application.

The manufacturer (name on request) of this machine has selected John S. Barnes hydraulics for the horizontal and vertical feeds required in profile milling. Trigger guards, triggers, gas chambers, and similar rifle and machine gun components are milled to proper size and shape. The machine is equipped with a table feed cylinder, a head feed cylinder and a vertical feed cylinder. These three cylinders control the profiling of the various gun parts. All cylinders have traverse, variable pressures and variable feeds in both directions. Machine operation is simplified: Operator loads part, vertical head then feeds down for a plunge cut or side cut as required. After the limit of downward travel has been reached, contact is made which engages table feed or head feed as required. Following these operations, both cylinders may feed either right or left, intermittently or steady, depending upon contour of part to be machined.



View showing solenoid controlled pressure changing valves, safety overload valves, and filters of the Profile Milling Machine Hydraulic Unit.

An automatic selection of fast or slow feed and automatic pressure increase or decrease has been provided. Both heavy and light cuts are thereby taken in their stride, and machining time reduced.



Another view showing side of hydraulic unit for Profile Milling Machine, including vertical feed and rectangular control. Unit is complete with Triplex Gear Pump and three Feed Pumps.

Some present users:

Manufacturers of

Machine Tools, Woodworking Machinery, Riveting Machinery, Printing Presses, Electrotype Shavers, Coal Mining Machinery, Valves.

This is another example of John S. Barnes hydraulic application to unusual machine cycles. For further information concerning the application to your machine design problems write for the data offered below.

FREE NEW DATA: Included in this 40 page book are typical installation circuits, complete data covering piston and gear pumps and complete information covering basic elements of construction and installation of standard units used in these highly successful hydraulic circuits. Write for your copy today. Ask for Bulletin T. E. 442.

John S. Barnes Corporation

DETROIT SALES OFFICE
503 NEW CENTER BLDG.
TR-1-1706

MAIN OFFICE
AND FACTORY
ROCKFORD, ILL.

Cutting a combination of both hard and soft steel without changing speed or type of wheel

The **CAMPBELL ABRASIVE CUTTING MACHINE NO. 302,** above, completes with one clean, fast, accurate cut a production job that formerly required several steps.

And—note—it is cutting flat stock that contains *both* hard and soft steel *without changing speed or type of wheel.*

There you have another example of the ability of **CAMPBELL ABRASIVE CUTTING MACHINES** to fit the great need today. That is why you find them on many important war production jobs, including—

- **Aircraft**
- **Aircraft Engines**
- **Propellers**
- **Army Trucks, Cars and Tanks**
- **Machine Guns, Bombs, Shells**
- **Small Arms Ammunition**
- **Projectiles**
- **Field Telephones**

Ask to have a Campbell Engineer make a study of *your* cutting problems. This involves no obligation and you may find his suggestions point to definite economies, greater production and better cutting.

ANDREW C. CAMPBELL DIVISION
BRIDGEPORT • CONNECTICUT

Campbell ABRASIVE CUTTING MACHINES

AMERICAN CHAIN & CABLE COMPANY, Inc.
BRIDGEPORT • CONNECTICUT

NEW LITERATURE . . . . . .

Of Interest to the Tool Engineer

(381) Priority Orders

Priorities In Force. 14 pp. Public Service Section, Inquiry Division, Room 1501, Social Security Building, Washington, D. C. This booklet is a printed compilation of priority orders and forms. It is an alphabetical listing of all the orders in the M,L,P,E. and Suspension series that have been issued through February 15, 1942.

(382) Pneumatic Cylinders

Rotating Type Cylinders for Chuck Operation. 4 pp. Hannifin Manufacturing Company, Chicago. This bulletin describes the various features of the cylinder giving the specifications and dimensions. It is fully illustrated.

(383) Grinding

Better Grinding. 96 pp. Landis Tool Company, Waynesboro, Pa. This book contains 100 two-color informal sketches classified under eighteen chapter headings. Numerous spaces have been provided for notes and a section is devoted to the picturing and describing of twenty-two modern Landis Grinders.

(384) Magnifier

New Magni-Ray. 4 pp. George Scherr Company, New York, N. Y. This folder describes the new Magni-Ray which is in use for all types of inspection of riveting, welding, repair and maintenance work, for inspection of small screw machine parts, stampings and other airplane manufacturing work.

(385) Dust Collectors

American "Dustube" Dust Collectors. 58 pp. American Foundry Equipment Company, Mishawaka, Indiana. Prepared as a handy manual to serve plant engineers and officials in the selection of proper control equipment for dust problems, it provides full information with operating data and photographs. A complete engineering manual section is included.

(386) Slotters

Douglas Precision Slotter. 8 pp. Douglas Machinery Company, Inc., 150 Broadway, New York, Dept., 805. This folder has photographs and drawings illustrating the slotter. All parts are described and complete specifications are given.

(387) Speed Control Units

More Output for Defense. 16 pp. Reeves Pulley Company, Columbus, Indiana. This booklet illustrates and describes numerous uses and applications for Reeves variable speed control equipment on many types of machines. The theme of the booklet is on how to increase production and cut waste.

(388) Stainless Steel

Characteristics of Rezistal Stainless Steels. Crucible Steel Company of America, New York, N. Y. This Data Sheet gives in tabular form the important information necessary in specifying or using the leading stainless steel grades.

(389) Die Castings

For Dense, Homogeneous Die Castings. 10 pp. The Phoenix Machine Company, Cleveland, Ohio. This folder describes the complete line of Lester-Phoenix die casting machines for zinc, tin, aluminum, brass and magnesium. It is completely illustrated and contains a specification sheet.

(390) Standards

American Standards for 1942. American Standards Association, 29 West 39th Street, New York. Nearly 500 standards are listed in a wide variety of industrial fields. These standards include definitions of technical terms, specifications for metals and other materials, methods of test for the finished product, dimensions, safety provisions for the use of machinery, and methods of work.

(391) Metals

Pre-Finished Metals. 4 pp. American Nickeloid Company, Peru, Ill. This folder is called a "defense sampler" and contains samples of plated metals, lists typical uses for them, and illustrates by means of a chart how they can help conserve more strategic metals for vital war production.

(392) Slotting Head

Double Duty. 4 pp. The Experimental Tool and Die Company, Detroit, Michigan. This folder describes and illustrates the universal slotmaster. Slotmaster parts and tools are also given.

(393) Dressers

Diamond Dressers for Industrial Wheels. 4 pp. Christensen Diamond Tool Company, 3683 East Willis, Detroit, Michigan. This folder describes a line of diamond tools produced by the Brostite process, a simultaneous application of resistance beating and pressure on a powdered metal matrix to mount diamonds. Illustrations are included.

(394) Fastening Devices

Fastening Data Book. 140 pp. Shakeproof Inc., 2501 North Keeler Avenue, Chicago. This book is designed to be a guide toward faster assembly operations for design engineers and production men. It contains detailed explanations of the many Shakeproof fastening devices. A special section is devoted to government specifications.

(395) Belts

Special Purpose Belts. 32 pp. L. H. Gilmer Company, Tacony, Philadelphia. This booklet describes belts for special applications that involve factors such as high speeds, close precision, shock loads double-friction-surface and very light duty. Belt specifications are given for grinders, drill presses, lathes and other machinery.

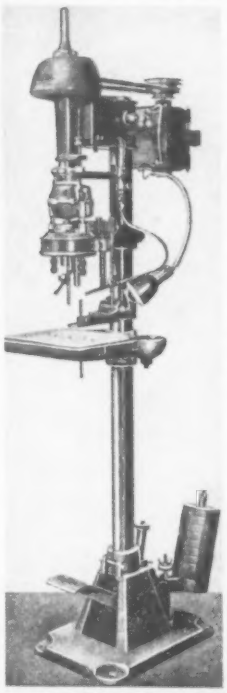
Manual

Scully-Jones and Company of Chicago have added to their defense effort by publishing a large 384 page Tool Engineering Manual. This new, substantially bound, manual contains much information and tooling data standard and special high production tools for many industries. A most unique method of indexing is used.

Every key man on tools such as, planning, engineering, purchasing, etc., will find this large volume useful. Copies may be secured from your local Scully-Jones representative or by writing direct to Scully-Jones and Company, 1901 S. Rockwell Street, Chicago, Illinois on your company letterhead. Because of a limited number of these books, only such requests will be honored.

HIGH TAPPING PRODUCTION with Unskilled Labor on this

Ettco-Emrick
FOOT-OPERATED TAPPING MACHINE



2400 accurately tapped holes per hour is easy on this foot-operated machine with the standard 2-spindle head as illustrated—and up to ***12,000 per hour*** with available Ettco-Emrick Multiple Tapping Heads.

Unskilled labor can do it because Ettco-Emrick design ***eliminates the human element from the actual tapping operation.***

WRITE FOR THESE BULLETINS

BULLETIN No. 4 gives full details about the machine and **BULLETIN No. 3** covers the multiple tapping heads. Copies mailed on request.

ETTCO TOOL CO., Inc.
586 Johnson Ave., Brooklyn, N. Y.
Detroit • *Chicago*

MAKERS OF **Ettco-Emrick** DRILL CHUCKS • TAP CHUCKS
MULTIPLE TAPPING AND DRILLING HEADS
TAPPING ATTACHMENTS • TAPPING MACHINES

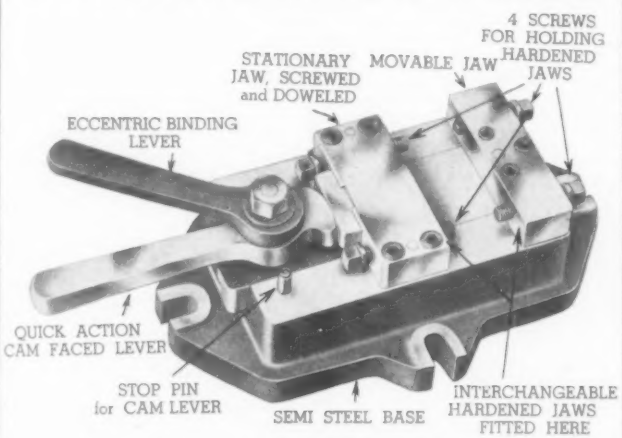
DIA-TOOL INC.

DIA-TOOL INC.

DIAMONDS
SET IN SINTERED TUNGSTEN CARBIDE

ASK FOR NEW 16 PAGE BOOKLET
AND PRICE LIST
320 YONKERS AVENUE, **YONKERS,** N. Y.

NEW PRODUCTO
CAM LOCK VISE
FOR PRODUCTION MILLING AND DRILLING



Made in 3 Sizes 4"—5"—7"

One jaw is stationary or fixed and the milling action or thrust is taken against this solid jaw. The movable jaw is controlled by the quick-action handle and locked by eccentric lever—both operated at once. This construction permits a very wide opening of the jaw and is quickly obtained.

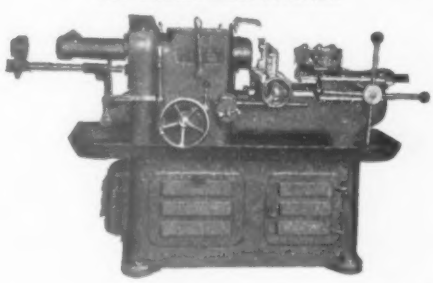
Quick shipments—all sizes.

WRITE TODAY FOR COMPLETE INFORMATION

THE PRODUCTO MACHINE CO.
BRIDGEPORT, CONN. **3017 MEDBURY, DETROIT**

MOREY No. 2G & No. 3 Turret Lathes
Motor Drive
INFINITE SPINDLE SPEEDS

Timken Taper Roller Bearings for Main Spindle
All Others Anti-Friction



	No. 2G	No. 3
SPEEDS from	90 to 1800 R.P.M. or 180 to 3600 R.P.M.	60 to 2100 R.P.M. or 100 to 3600 R.P.M.
CAPACITY	1"x6½" turning length	1½"x9" turning length Made in Plain and Universal Types
	Ask for Bulletin No. 629	*Ask for Bulletin No. 727*

Any spindle speed you want—a direct reading dial shows when you've got it.

Permits the use of carbide tools for fast cutting.

Turret clamps and unclamps automatically.

Equally effective on second operation and chucking work.

MOREY MACHINERY CO., INC.
410 Broome Street **New York, N.Y.**

NEW BOOKS

Iron Men and Their Dogs by Ferdinand C. Latrobe. 225 pp., $4.50. The Horn-Shafer Company, 3 and 5 East Redwood Street, Baltimore, Maryland.

This story of the progress of iron men and their dogs portrays the growth of Bartlett-Hayward from cook stoves to massive reclamation project castings, from cast-iron to an epoch-making high tensile bronze, from domestic water heating boilers to gigantic modern gas holders. All its progress has been under the talisman of two cast-iron replicas of the primogenitors of the Chesapeake Bay dog.

This interesting industrial history is fully illustrated and includes copies of many rare prints.

Machine Shop Theory and Practice by Albert M. Wagener and Harlan R. Arthur. 306 pp. Paper bound $1.60, cloth $2.28. D. Van Nostrand Company, Inc., 250 Fourth Avenue, New York. Because most of the available books in this field are too advanced and complex, this textbook has been designed to meet the needs of beginners in the study of machine tools and their operations. It is intended for apprentices in the tool and die making, machinist, and allied trades. The entire text is illustrated with photographs and sketches of the important tools and operations.

Work Routing, Scheduling and Dispatching In Production by Professor John Younger and Joseph Geschelin. 160 pp. price $3.25. The Ronald Press Company, 15 East 26th Street, New York. This book has been written for two groups of readers: executives concerned with problems of industry, and students of industrial management and engineering in college classrooms. Throughout the book, care has been taken to state plainly the underlying principle or law for each step in the control of the work routing program, and at the same time to show how these fundamentals are put into everyday practice.

Diamond and Gem Stone Industrial Production by Paul Grodzinski. 256 pp. 15 shillings (about $3.75). N. A. G. Press Ltd. 226 Latymer Court, London, W. 6. In this book all available experience of modern methods of machining of flat and curved surfaces including holes has been carefully sifted and arranged. The material in this book is based to a large extent on the traditions of craftsmanship. 183 illustrations are included.

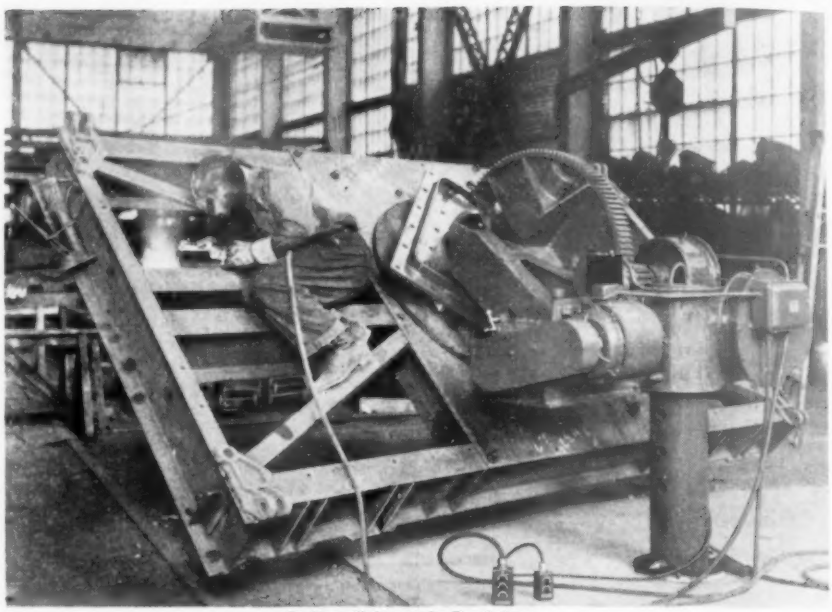
United States Government Manual. 700 pp. 75 cents. Office of Government Reports, Federal Headquarters in your district. This book tells all about who's who and what's what in the new war agencies. It also contains descriptions of the functions and operations of the legislative, judicial, and executive branches of the Government. A section devoted to organization charts which clarify the operations of these department and war agencies is included.

Practical Arc Welding, A Textbook by W. J. Chaffee. 516 pp. Flexible, fabrikoid cover. $2.00. Hobart Trade School, Inc., Troy, Ohio. Acceleration of welding activity has caused an unprecedented demand for trained welding personnel. This practical handbook was written to help experienced welders keep abreast of modern procedures and techniques. It has also been made easily comprehensible to beginners. Part I concerns general welding information. Parts II and III contain the complete series of arc welding lessons, exactly as offered in the Hobart Trade School. Parts IV and V include a dictionary of welding terms and helpful tabular data.

NEW EQUIPMENT, Materials, Processing

C-F POSITIONERS (G28)

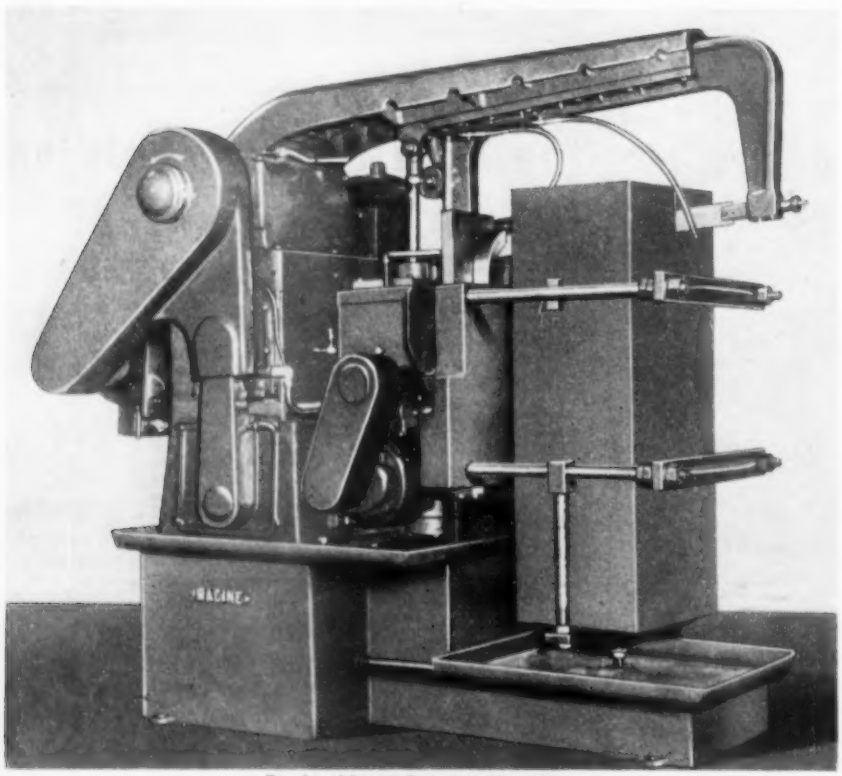
A machine which will provide a complete maneuverability of even cumbersome weldments with a minimum of handling is built by the Cullen-Friestedt Company, 1318 S. Kilbourn Avenue, Chicago. The table tilt is from horizontal to 135 deg. from horizontal and has a complete table rotation of 360 deg. The table height is adjustable and is removable to provide for special fixtures and jigs. These machines are manually operated or power operated by a variable speed drive.



Cullen-Friestedt Positioner
Makes cumbersome work easy to handle.

RACINE METAL CUTTING MACHINES (G29)

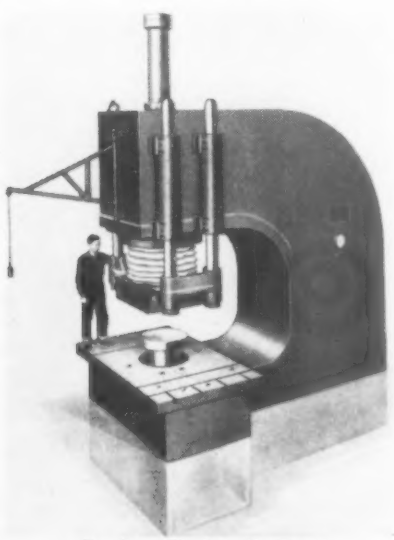
A special machine for cutting large shapes and for special angle cutting has been developed by the Racine Tool and Machinery Company, Racine, Wisconsin. This heavy duty hydraulic sawing machine has a stub table and sub base arrangement. The table is equipped with a clamping fixture which is specially mounted to permit the cutting of angle or quarter sections. These machines can be had in capacities of 10 inch by 10 inch to 14 inch by 20 inch.



Racine Metal Cutting Machine
Made to cut large shapes and special angles.

DENISON HYDRAULIC PRESS (G30)

Recently completed by the Denison Engineering Company, Columbus, Ohio, this 400 ton C-frame hydraulic press combines the main ram, rapid traverse cylinder, and a stripper cylinder operating through the bolster. The oil reservoir, the hydraulic pump and motor, the motor starter, electrical controls, and the control valves are all assembled within the open or C-type frame.



Denison Hydraulic Press
Has a 30 inch stroke.

WATSON-STILLMAN STRAIGHTENING PRESS (G31)

Used to straighten shafts from 12 to 18 inches in diameter and from 7 to 60 feet long, a huge 1000 ton straightening press has just been made by the Watson-Stillman Company, Roselle, N. J. An interesting fact is that one man handles its entire operation without

FREE INFORMATION and SERVICE

Request the information and service you desire and keep your library up-to-date . . .

THREE FREE SERVICES . . . WITHOUT OBLIGATION

For your convenience, these three business reply cards enable you to request quickly . . .

1 New catalogs—bulletins listed in this issue.

2 Additional information or bulletins relative to new equipment—new materials or new processes.

3 When answering advertisements, specific information on problems or company representative's call.

•

HOW TO ORDER

Simply fill out the card, indicating the information or service you desire, and mail. Be sure to write, in the square, the identifying number of the catalogs or bulletins covering new products described. In answering an advertisement, include the name of the advertiser and indicate by a cross if literature is desired or if company representative should call. No stamp is required.

1

USE THIS CARD for requesting new catalogs and bulletins listed in this issue.

2

USE THIS CARD for requesting additional information or bulletins relative to new equipment, materials, processes, etc.

3

USE THIS CARD when answering advertisements, to obtain specific information on problems or when you desire a company representative to call.

Write in square, number of item describing one catalog wanted ➡ ☐

NAME

COMPANY

ADDRESS

TITLE

THE TOOL ENGINEER, APRIL 1942

Write in square, number of item describing one catalog wanted ➡ ☐

NAME

COMPANY

ADDRESS

TITLE

THE TOOL ENGINEER, APRIL 1942

Write in square, number of item describing one catalog wanted ➡ ☐

NAME

COMPANY

ADDRESS

TITLE

THE TOOL ENGINEER, APRIL 1942

Write in square, number of item describing one catalog wanted ➡ ☐

NAME

COMPANY

ADDRESS

TITLE

THE TOOL ENGINEER, APRIL 1942

Write in square, number of item describing one catalog wanted ➡ ☐

NAME

COMPANY

ADDRESS

TITLE

THE TOOL ENGINEER, APRIL 1942

Write in square, number of item describing one catalog wanted ➡ ☐

NAME

COMPANY

ADDRESS

TITLE

THE TOOL ENGINEER, APRIL 1942

Write in square, number of item describing one catalog wanted ➡ ☐

NAME

COMPANY

ADDRESS

TITLE

THE TOOL ENGINEER, APRIL 1942

Write in square, number of item describing one catalog wanted ➡ ☐

NAME

COMPANY

ADDRESS

TITLE

THE TOOL ENGINEER, APRIL 1942

PAGE NO.

NAME OF ADVERTISER

☐ **Literature** ☐ **Have Representative Call**

NAME

COMPANY

ADDRESS

TITLE

THE TOOL ENGINEER, APRIL 1942

PAGE NO.

NAME OF ADVERTISER

☐ **Literature** ☐ **Have Representative Cal**

NAME

COMPANY

ADDRESS

TITLE

THE TOOL ENGINEER, APRIL 1942

PAGE NO.

NAME OF ADVERTISER

☐ **Literature** ☐ **Have Representative Call**

NAME

COMPANY

ADDRESS

TITLE

PAGE NO.

NAME OF ADVERTISER

☐ **Literature** ☐ **Have Representative Cal**

NAME

COMPANY

ADDRESS

TITLE

USE THESE *FREE* REPLY CARDS

They are provided for your convenience in requesting information and service . . . . .

FIRST CLASS
PERMIT No. 6691
(Sec. 510, P. L. & R.)
DETROIT, MICH.

BUSINESS REPLY CARD
NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES

2c.-POSTAGE WILL BE PAID BY—

THE TOOL ENGINEER
THE BRAMSON PUBLISHING COMPANY
2842 W. GRAND BLVD.
DETROIT, MICHIGAN

1

Request for:
NEW CATALOGS
BULLETINS
BOOKLETS

FIRST CLASS
PERMIT No. 6691
(Sec. 510, P. L. & R.)
DETROIT, MICH.

BUSINESS REPLY CARD
NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES

2c.-POSTAGE WILL BE PAID BY—

THE TOOL ENGINEER
THE BRAMSON PUBLISHING COMPANY
2842 W. GRAND BLVD.
DETROIT, MICHIGAN

2

Request for additional information and catalogs covering
NEW EQUIPMENT
MATERIALS
PROCESSES

FIRST CLASS
PERMIT No. 6691
(Sec. 510, P. L. & R.)
DETROIT, MICH.

BUSINESS REPLY CARD
NO POSTAGE STAMP NECESSARY IF MAILED IN THE UNITED STATES

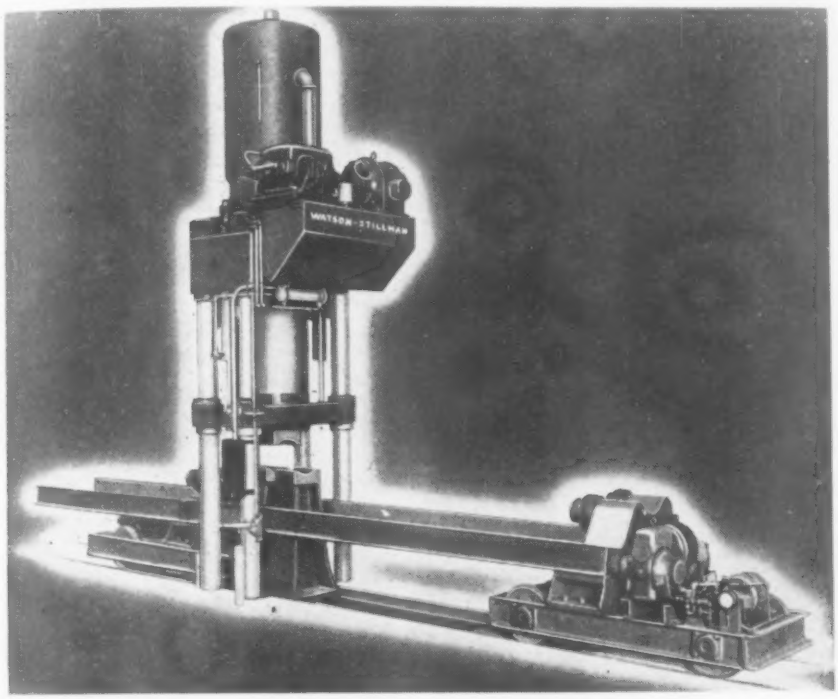
2c.-POSTAGE WILL BE PAID BY—

THE TOOL ENGINEER
THE BRAMSON PUBLISHING COMPANY
2842 W. GRAND BLVD.
DETROIT, MICHIGAN

3

ANSWERING ADVERTISEMENTS
Requesting:
LITERATURE
REPRESENTATIVE
TO CALL

moving from a central control panel. For handling and positioning work there are two sets of rollers. One set is motor driven to rotate the work as required. When the work is positioned, the lifting rams under the rollers lower it on two bending blocks.



Watson-Stillman Straightening Press
One man handles its entire operation.

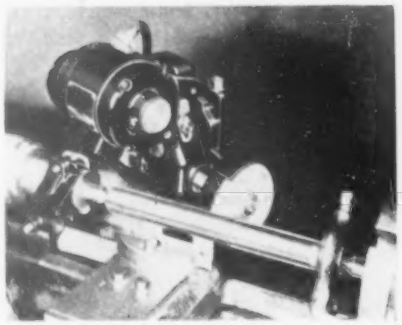
LIBBY RAM TYPE TURRET LATHE (G32)

A new universal ram type turret lathe, known as the Libby No. 4, has just been announced by the International Machine Tool Corporation, Libby Division, Indianapolis, Indiana. Supplied complete with tools for both bar work and chucking work, this machine will accommodate 8, 10, and 12 inch diameter chucks. In addition, this machine may be equipped with special attachments which conform to specific applications or specific types of lathe work. These attachments include bar feed and collet chuck, taper attachment, and threading attachment.

Cast from nickel semi-steel, the one piece bed and headstock is extra wide across the bed ways, measuring 12½ inches. The heavy bed has internal cross ribs and longitudinal ribs that run the entire length to provide reinforcement.

DUMORE THREAD GRINDER ATTACHMENT (G33)

The thread grinder attachment being built by the Dumore Company, Racine, Wisconsin is revolutionary because it enables the grinding of threads on a lathe which in the past could not be done. Both external and internal threads can be ground with this attachment. Any external thread having a pitch within the commercial range can be ground. However, the grinding of internal threads is limited and depends upon the depth of the threaded hole, the pitch of the thread and its diameter.

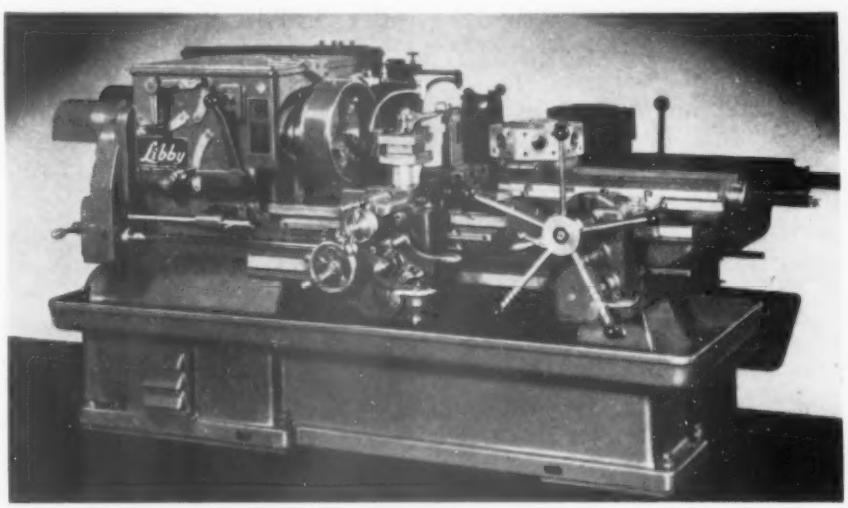


Dumore Attachment
Enables thread grinding on lathe.

ALLEGHENY LUDLUM DBL HIGH SPEED STEEL (G34)

DBL, a tungsten-molybdenum high speed steel developed by the Allegheny Ludlum Steel Corporation, Pittsburgh, contains less than one-third the amount of tungsten contained in the commonly used 18-4-1 type of high speed steel. It also weighs about eight percent less giving more tools for a given poundage. Although DBL is sixteen percent less expensive than 18-4-1, its cutting performance is said to equal or better that of 18-4-1. Moreover, DBL needs no coating to control decarburization and requires no new technique or apparatus

Allegheny's DBL
Speeds up production.

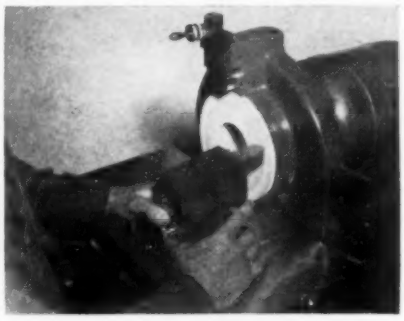


Libby Ram Type Turret Lathe
Features bed ways measuring 12½ inches wide.

for heat-treating. The company has offered royalty-free licenses for the life of the DBL patent in an effort to help conserve the nation's supply of tungsten.

BURA-WAY GRINDING MACHINE (G35)

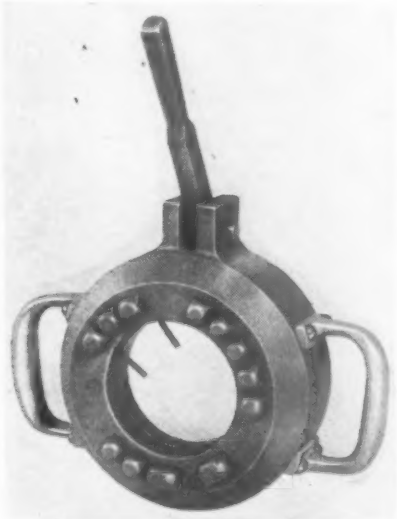
Marked increases in machine production are claimed to result from the use of a new formula and tool-grinding machine introduced by the James Donaldson Company, 230 Park Avenue, New York. The formula provides a scientific method of establishing the precise relief and clearance angles every tool should have for the work it is to perform. The machine is said to make possible for the first time the grinding in of the profile, reliefs, or clearance angles and, in form tools, the necessary radii or curvature. The form of the tool point is determined by a cam, which is attached to the tool holder and acts as a guide for the operator as he slides the tool holder on the table in a rotating motion while bringing the tool in contact with the wheel.



Bura-Way Grinding Machine
Grinds profiles and reliefs.

MARKING TOOL FOR STAMPING SHELLS (G36)

This ring style steel stamp holder has been developed by Jas. H. Matthews and Company, Pittsburgh. It is used for marking required data into the base of finished shells. The holder is placed over the base of the shell and is held firmly in place by pulling down a lever at the side. The base of the shell is legibly marked by lightly tapping each stamp. The stamps can be quickly changed by the removal of a spring. A feature of the holder is that it can be carried to the shells instead of shells being carried to the working device.

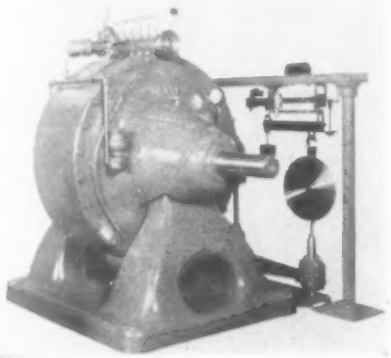


Marks data on shells.
Matthews Marking Tool

TAYLOR DYNAMOMETERS (G37)

The recently improved "HI-EFF" hydraulic dynamometer manufactured by the Taylor Manufacturing Company, Milwaukee, Wisconsin, is available in a wide range of sizes for both high speed —low torque and also low—high torque testing. Speed, load, lubrication, and packing are said to be readily accomplished while operating. The controls

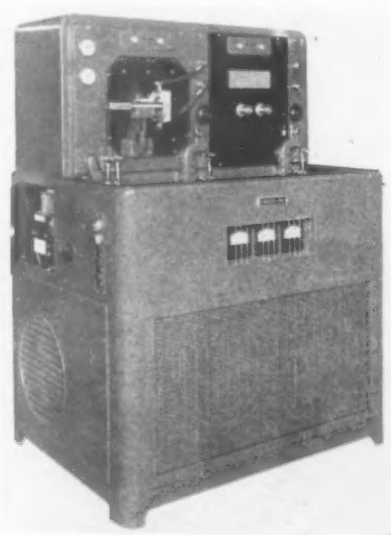
are arranged for rapid manipulation throughout the entire range. The combination peripheral and side-wall vanes in both the stator and the rotor is said to result in a remarkably high capacity within a comparatively small machine.



Taylor Dynamometer
Controls arranged for rapid use.

TOCCO INDUCTION UNITS (G38)

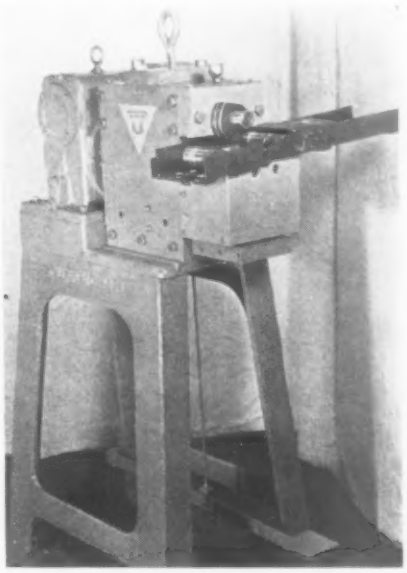
The addition of a two-station 20 KW unit and a 200 KW unit to a line of induction equipment has been announced by the Ohio Crankshaft Company, Cleveland. Some of the defense uses to which TOCCO machines are put include hardening of armor piercing shot, brazing of aviation fuselage and engine parts, heating for shaping of shells, heating for forming of aviation propellor hubs, annealing cartridge cases, and surface hardening of parts.



TOCCO Induction Unit
Has many defense uses.

CUNNINGHAM SHELL MARKING MACHINES (G39)

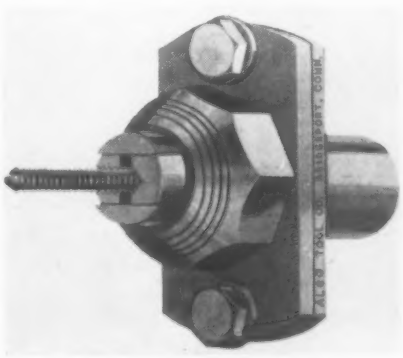
The M. E. Cunningham Company, Pittsburgh has developed a machine for marking and knurling 20 MM, 37 MM, and 40 MM shells. This machine also works on the single revolution action. It works completely automatic after the shells have been placed into the feeding chute. Unique cam actions allow one shell to roll into place, the mark is made, and then the shell is ejected by another cam. It is claimed that the machine can be run continuously and can produce approximately 1000 shells per hour. A similar machine marks 75 MM to 155 MM shells.



Cunningham Shell Markers
Have unique cam action.

ALCO TAP HOLDER (G40)

Built by the ALCO Tool Company, Bridgeport, Conn., this tap holder is said to be the only one on the market with floating alignment and adjustability for any size tap within its range. There is clearance for rapid cross slide tool movement. No bushings are required and tap is held securely. A concentric alignment feature is said to guarantee perfect threads, eliminate inspection and rejects, cut set-up time to a minimum, and increase the life of the taps.



ALCO Tap Holder
No bushings required.

DI-ACRO STAMPING AND FORMING UNITS (G41)

To eliminate the expense of making blanking or forming dies for short run work, a number of precision hand-operated bench machines have been developed by the O'Neil-Irwin Manufacturing Company, Minneapolis, Minn., as alternatives for this type of work. It is claimed that in a great many instances this equipment can duplicate metal stampings accurately on a semi-production basis without the need for dies.

Di-Acro Units
Save on short run work.

These machines are frequently able to eliminate one or more operations in complicated progressive die work.

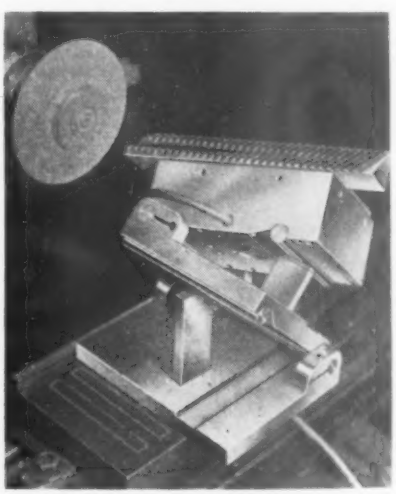
PEASE BLUE PRINTING MACHINE (G42)

The latest blue printing machine brought out by the C. F. Pease Company, Chicago, is model 77, a high pressure quartz tube printer. This machine was developed in answer to a demand for a fast printer for making direct process as well as blue prints.

Pease Blue Printing Machine
Also makes direct process.

ROBBINS MAGNA-SINE (G43)

Developed by the Robbins Engineering Company, Detroit, this Magna-Sine is said to do away with cumbersome, old fashioned systems of clamps. It increases both speed and accuracy of all grinding involving either single or compound angles it is claimed.

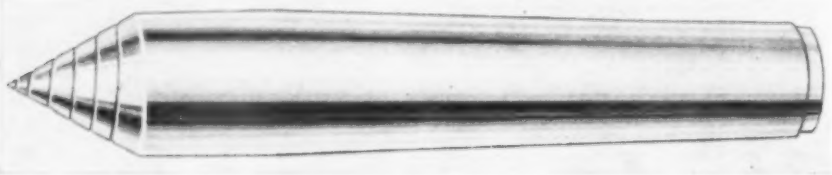


Robbins Magna-Sine
Does away with clamps.

CMD LATHE CENTER (G44)

Intended for the purpose of lubricating the entire surface of work supported by the dead center or tail stock, this helical groove lathe center is manufac-

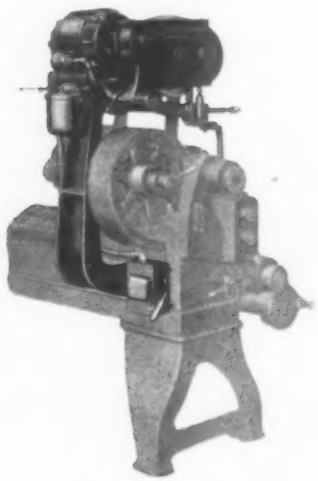
tured by the Chicago Manufacturing and Distributing Company, Chicago. It is claimed that this center expels heat from work caused by cutting tools by conveying lubricant to extreme point of work. There is no stopping of work to relubricate because the grooves hold a supply of lubricant.



CMD Lathe Center
Lubricates entire surface of work.

CULLMAN MOTOR DRIVE UNIT (G45)

An individual motor drive unit to be used in modernizing equipment such as lathes, milling machines, punch presses, and shapers originally driven by overhead belting, has been developed by the Cullman Wheel Company, 1352R Altgeld Street, Chicago. This drive is said to increase machine efficiency without loss of belt drive smoothness. The direct drive increases the safety element, affords instant and convenient control, and permits better lighting. The drive is available for motors from ¼ to 15 hp. Installation is simple, only four bolt holes being necessary for attachment to the average machine.



Cullman Drive Unit
No overhead belting.

DESPATCH FURNACES (G46)

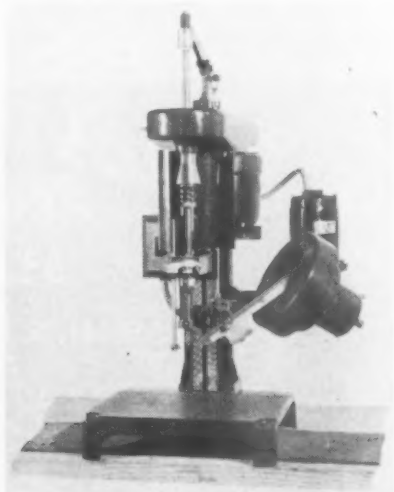
The illustration below shows a compact layout for heat treating annealing brass shell cases. The furnaces shown are manufactured by the Despatch Oven Company, Minneapolis, Minn. The layout requires a minimum of floor space and man power. It is said to maintain a smooth flow of material to presses for each process to produce — mm shell cases per hour. All furnaces in this line-up are of the same size, which makes for greater flexibility and allows for easy interchange of furnaces under all operating conditions and is said to reduce the danger of a bottleneck at any point in the department. Blanks coated with drawing compound are brought to the drum type continuous washing machine in boxes. This washing machine is approximatetly 10′ long, automatically washes and rinses the blanks and loads them into a furnace basket. The fur-

nace basket goes to the proper furnace by monorail for annealing. Upon completion of heat treatment the basket is withdrawn from the furnace and by conveyor goes to the quench. Both air and water quenches have been used successfully. After quenching, the basket goes again by conveyor and blanks are dumped into a machine that automatically pickles, rinses, neutralizes them. The clean blanks are returned in tote boxes to the press for cupping. After cupping the same cycle is repeated and repeated over again for further draws.

MAGAZINE FEED POWER SCREWDRIVERS (G47)

Detroit Power Screwdriver Company, 2801 West Fort St., Detroit Michigan, are the manufacturers of the Magazine Feed Power Screwdrivers for production screwdriving, shown in the illustration below. This company manufactures three models ranging in capacities for screws from 2 x 1/8" long up to 5/8 cap screws 2 1/4" long. The company also manufactures Motorized Hopper Units for feeding all sorts of parts besides screws and nuts. The type of brackets designed make it possible to adapt these hoppers to hydraulic or crank presses and special machines. These hoppers are designed in sizes 10-12 and 16" diameters. In addition, Detroit Power Screwdriver Company has also brought out a counting machine for releasing a certain number of screws at one time. The adjustable escapement on this machine can be set to release from one to several screws at one time.

Despatch Furnaces
Heat treating shell cases.



Detroit Power Screwdriver
Has motorized hopper unit.

STERLING SPEED BLOC SANDER (G48)

This is a portable air-driven single-block machine for sanding under-coats dry or wet; feathering out damaged places for repair painting or finishing; rubbing top coats with rubbing compound; and many other operations formerly requiring slow laborious hand work. The Sterling Speed-Bloc Sander weighs approximately 5 1/2 lbs.; measures 7-in. long 4 3/4 in. high and 3 3/4 inches wide. It has a 5/8 inch stroke. It operates on 50 to 60 lbs. air pressure, using about 6-cu. ft. per minute under

Mark Iron, Steel and Carbides the

Etchograph Way

•

2000 IN USE

NEW JUNIOR MODEL

Buy the Original Electric Etcher

Three sizes to meet all requirements. Also a combined Etchograph and Demagnetizer.

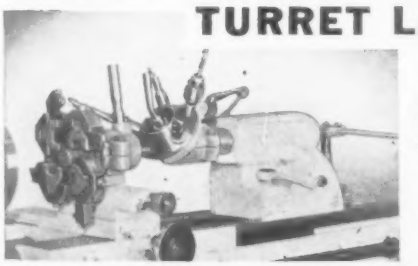
With New ELKONITE TIP Pencil

Mark hardened parts, tools, dies, gages and fixtures of any ferrous metals including the hardest alloys and carbides — quickly — plainly.

Write for circulars and prices.

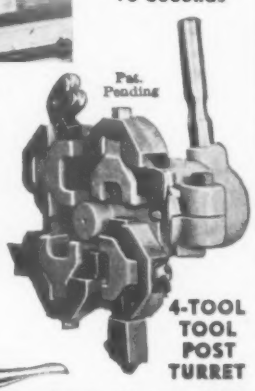
BREWSTER-SQUIRES COMPANY
54 Church Street
NEW YORK, N. Y. U. S. A.

DON'T WAIT FOR TURRET LATHES



Convert Your ENGINE LATHE into a TURRET LATHE in 15 Seconds

Photo Shows Turrets on 16" Lathe

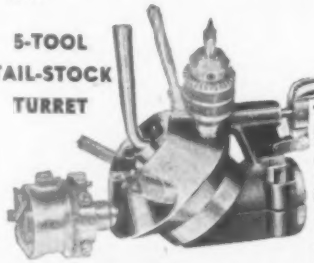


Pat. Pending

4-TOOL TOOL POST TURRET

This new modern TOOL-POST TURRET, made in 2 sizes, designed to increase production on engine lathes. Easily mounted on cross slide or compound rest. Has capacity of 4 standard made tool holders which can be easily inserted and rigidly held.

5-TOOL TAIL-STOCK TURRET



Then there's the completely modernized 5 Tool TAIL-STOCK TURRET, made in 4 sizes. Also the ADJUSTABLE PULL-FEED LEVER. All tools are precision made attachments which will convert any engine lathe into a production turret lathe. To fit small bench lathes up to lathes with 20" swing.

Write for bulletin of these and other JEFFERSON TOOLS.

JEFFERSON MACHINE TOOL CO.
669-679 W. 4th ST. CINCINNATI, OHIO

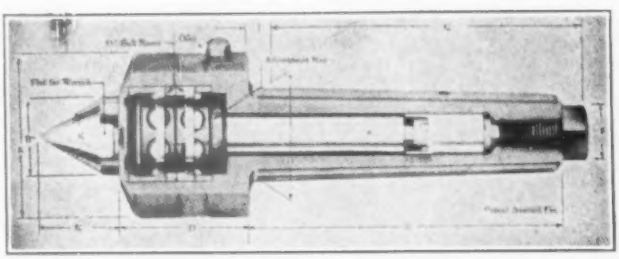
The Improved Nielsen Live Centers

LOAD CAPACITY—200 TO 40,000 LBS. AT 100 RPM.

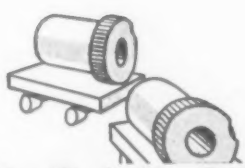
HAVE ADJUSTMENT TO TAKE UP WEAR AND PRELOAD BEARINGS

STANDARD MORSE TAPER No. 2 TO 6 IN STOCK

Write For Catalogue



NIELSEN, INCORPORATED
LAWTON, MICHIGAN



3 DAY DELIVERY ON UNIVERSAL DRILL BUSHINGS

In these days when speed is all important, your production need not be held up for want of drill bushings. For Universal drill bushings in all standard sizes (not special sizes) are now available on a 3-day delivery schedule. With super-finished bores, straight and round within .0001, Universal drill bushings assure accuracy and unexcelled wearing qualities. Write today for further facts and prices.

UNIVERSAL ENGINEERING CO.
FRANKENMUTH • MICHIGAN

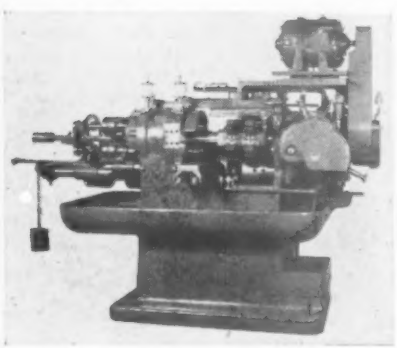
Sterling Sander
Said to be extremely flexible.

load. Approximate speed at 60 lbs. air pressure is 3000 strokes per minute. Due to the unusual construction of the rubber composition sanding pad, the Sterling Speed-Bloc Sander is said to be extremely flexible. This permits the working of curved as well as flat surfaces. Manufactured by Sterling Tool Products Company, 363 E. Ohio Street, Chicago, Illinois.

REBUILT MACHINERY (G49)

A typical screw machine before and after being rebuilt and modernized by The Modern Collet and Machine Company, Ecorse, Michigan, is shown in the illustration below. In the usual rebuilding processes, as employed by this company, the machines are stripped to the frame and then rebuilt with every modern improvement being incorporated. They are guaranteed for accuracy and operating efficiency.

Screw Machine Rebuilt
Before.



After.

Ideal Dresser
Cuts wheel replacement.

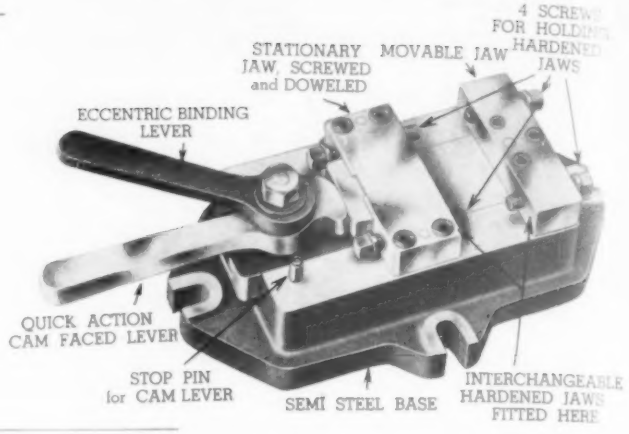
IDEAL GRINDING WHEEL DRESSER (G50)

The Ideal "Tru-Dress" Grinding Wheel Dresser — manufactured by the Ideal Commutator Dresser Company, Sycamore, Illinois, trues and cleans grinding wheel surfaces, removes cut up and uneven sides, removes deep grooves and out of roundness, thus cutting wheel replacement to a minimum. Its use is illustrated above.

PRODUCTO CAM LOCK VISE (G51)

Developed for a fire arms plant where considerable milling is done on rifles and guns, this cam lock vise built by the Producto Machine Company, Bridgeport, Conn., is quick-acting. One jaw is stationary or fixed and the milling action or thrust is taken against this solid jaw. The movable jaw is controlled by the quick-acting handle. This construction is said to permit a very wide opening of the jaw. An operator familiar with the use of the vise is said to be able to operate both handles with one hand.

Producto Cam Lock Vise Gives *quick action.*



KOEBEL DIAMOND TOOLS (G52)

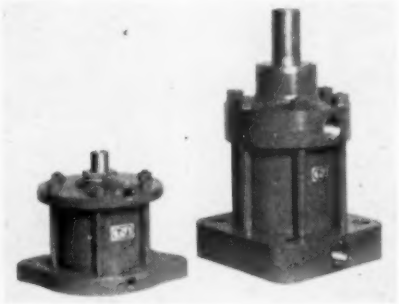
Koebel Diamond Tool Company, Detroit, Michigan, manufacturers of diamond tools,—using diamonds, set in a patented alloy called Koebelite have adopted the unusual practice of filing and indexing blue prints of each new job they receive. Thus, subsequent calls for tools having the same specifications can thus be filled rapidly and economically by referring to the library of blue prints. The use of this material, known as Koebelite, which it is said, fuses well below critical diamond temperatures and has practically the same coefficient of expansion, has been largely responsible for the increasing use of small diamonds.

Koebelite
Increases use of small diamonds.

TOMKINS JOHNSON CYLINDERS (G53)

Pneumatic and hydraulic cylinders are a specialty of the Tomkins Johnson Company, Jackson, Michigan. Features claimed for Tomkins pneumatic cylinders are self-sealing packings, honed and hard chromium plated cylinder walls, hard chromium plated

piston rods, cushioned and non-cushioned types. Hydraulic cylinders of this company's manufacture embody the following features; packing sealed pistons, wide bearing pistons, bushing guided piston rods, honed cylinder bodies.



Tomkins-Johnson Cylinders
Have self-sealing packings.

Large Collet
For oil pipe production.

MODERN COLLET (G54)

The illustration above shows what is believed to be the largest Collet ever made, the design pictured here was built by Modern Collet and Machine Company, Ecorse, Michigan, for the production of oil pipe. Other manufacturers of Collets are The Morrison Machine Products, Division of Hardinge Brothers, Elmira, N. Y.

TURRET TOOL POST (G55)

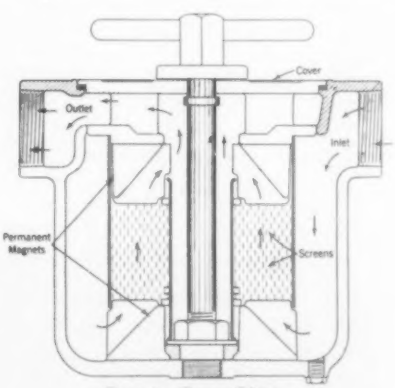
The Mastercraft Turret Tool Post, shown below, has just been announced by the manufacturers, F. & M. Sales Co., Hollywood, California. Precision manufacturing methods, it is stated, render all parts completely interchangeable, thus permitting the user to set aside the tool block with all tools remaining in place

for future use, while another tool block is being used on the same post. Many difficult tool set-ups may thus be preserved for subsequent runs at a great saving in set-up time. Claimed to be much faster acting, hardened throughout, and self-compensating for wear in hard service. The new Mastercraft 4-way Indexing Turret Tool Post is designed especially for use on 10" South Bend and 9" Workshop and similar lathes, as well as for small screw machines.

Turret Tool Post
Tool set-ups preserved.

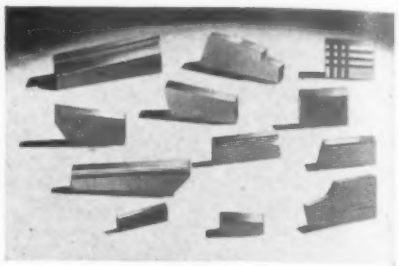
MAGNET FERROFILTER (G56)

S. G. Frantz Co., Inc., manufacturers of magnetic separators, 161 Grand Street, New York City has developed a Permanent Magnet FerroFilter with greater capacity than any previous FerroFilter of this type. The new model is designated as PQ-6; capacity 200 G.P.M.; pipe size connection 3 inch; height 15⅝"; has no moving parts. This model is especially adapted to removal of harmful fine iron and steel particles from circulating coolant systems of machines used in tapping, grinding, deep



Frantz FerroFilter
Has greater capacity.

hole drilling, reaming, rifling, etc., also from circulating lubricating oil systems of pumps, diesel and blooming mill engines, rod mills, roll grinders, etc. The illustration shows the internal construction of this model.



Special Crobalt Blades
Used in boring and reaming.

CROBALT TOOLS (G57)

Crobalt, a cast non-ferrous cutting alloy of Tungsten, Cobalt and Chromium was developed in 1932 by Crobalt Company, Ann Arbor, Michigan. Crobalt engineered tools are said to be used in innumerable machining operations—including boring, turning, milling, slotting, reaming and parting. It is stated that the material replaces high speed steel where greater abrasion resistance and high cutting speed are required. Its hardness at high temperature, it is claimed, makes it possible to cut at speeds which quickly soften and destroy heat treated tools. It is also claimed that Crobalt replaces cemented carbides when tool failure is caused by chipping and breakage and it is said to have greater resistance to impact and also freedom from chipping. It is claimed for Crobalt that it does not lose its cutting qualities until the alloy is heated well above 2000 degrees. The illustration above shows some special Crobalt boring and reaming blades.

JOHNSON TEMPERING AND DRAWING FURNACE (G58)

A new tempering and drawing furnace has just been announced by the Johnson Gas Appliance Company, 550 E Avenue N. W., Cedar Rapids, Iowa, makers of industrial furnaces. It is claimed that this furnace speeds the tempering of tools, dies, small parts, and non-ferrous castings. Designed as a production furnace, it is compact and requires very little floor space. It is heavily lined with insulating refractory and equipped with two large Johnson atmospheric burners.

THE PASSING PARADE . . . .

Promotions . . . Personals . . . Deaths . . .

OTTO FRANKE, new general works manager of the Dodge Division of Chrysler Corporation, is a Tool Engineer from way back. For two years prior to his present appointment, he was master mechanic of Dodge, and for nine earlier years he served as master mechanic of Plymouth. From 1923 to 1928, he was a member of the factory executive staff of the Chrysler Jefferson Avenue plant in Detroit.

To the War Production Board: *A. G. BRYANT*, president of Bryant Machinery and Engineering Company, Chicago, and general sales manager for the Cleereman Machine Tool Company, Green Bay, Wis., has been appointed to the machine tools advisory committee.

F. W. EATON, long connected with the Burroughs Adding Machine Company as Supervisor of Apprentice Training, has been loaned to WPB to become Assistant District Representative in the Detroit area. His new duties are in the Training Within Industry Division.

RALPH B. ROGERS, president of the Edwards Company, manufacturers

OTTO FRANKE
New General Works Manager

A. G. BRYANT
To War Production Board

FLOYD W. EATON
Supervisor Apprentice Training

of self-propelled railway passenger motor cars, is also heading the management of the Hill Diesel Engine Company, recently purchased by Edwards. Rogers has been prominently identified with the diesel engine industry for many years as a distributor and producer of diesel power units. The Edwards' Sanford, North Carolina plant and Hill's Lansing, Michigan manufacturing activities will both be under control of executive offices in New York. *R. E. OLDS*, outstanding figure in the automobile industry's development, remains as chairman of the board of the Hill company.

RALPH E. ROGERS

Pioneer Engineering & Manufacturing Company, Detroit, has gained the services of *W. C. CAMPBELL* as Assistant to the President, according to A. M. Sargent, President of the company. *CHARLES A. BONAMY*, new Office Manager of the Pioneer organization, will assist F. C. Querry, Secretary-Treasurer.

An old-fashioned success story, with modern angles, is told in the appointment of *JOHN DE MOOY* as President of the Cleveland Pneumatic Tool Company. Forty years ago, De Mooy clerked in the shipping department, writing bills of lading and stenciling names on packing cases. He now succeeds *L. W. GREVE* who died February 2. Mr. Greve's son, *FRED B. GREVE*, was named treasurer of the company, a position occupied by De Mooy for the last twenty years. Thirty-three year old Mr. Greve becomes the youngest executive in the company.

CHARLES A. BONAMY
Assistant to F. C. Querry

R. S. CLINGER, Chicago district manager in charge of Aristoloy alloy steels sales for Copperweld Steel Company of Warren, Ohio, announces the occupation of new offices at 122 S. Michigan Avenue.

Duncan Tool Designing Company of Buffalo, has opened a branch office in that city at 1700 Elmwood Avenue. *ANDREW J. DUNCAN* reports that a 10% pay raise to employes of both its offices, has been given in the form of Defense Stamps, which employes will exchange for bonds at their Post Office.

WILLIAM J. YOUNG, owner of the Lynn Machinery Company, Lynn, Massachusetts, and former president of the Lynn Chamber of Commerce, died recently.

JOHN WILSON, of the Jessop Steel Company, Washington, Pa., has been promoted to the position of Production Superintendent. *JOHN* and his brother *HARRY*, who is Vice-President in

charge of operations, constitute a unique association in that they are the seventh generation of the Wilson family to serve the Jessop company and its predecessor, Wm. Jessop & Sons of Sheffield, England. Another Jessop appointment is that of *R. W. AIKEN* to become Plant Engineer. Aiken was previously Chief Engineer with Frazier-Simplex, Inc.

JOHN H. ASHBAUGH, acting manager of manufacturing and engineering at the Westinghouse plant in Springfield, Mass. has been appointed manager of the two departments and will be stationed at Mansfield, Ohio.

Ashbaugh started with Westinghouse in 1918 as a student engineer in the East Pittsburgh works. He was assigned to the company's activities in the comparatively new field of instruments for aircraft wireless sets. Next he worked on meters and relays, then became section engineer in the automatic regulator section, where he attracted wide attention for his developments in voltage control apparatus for power houses and industrial applications.

In March, 1931, he was transferred to the merchandising division as assistant manager of engineering at Springfield. In less than a year he was named manager of engineering.

GEORGE A. MOHLMAN, vice president since 1927 of the Package Machinery Company, Springfield, Mass. was elected president of the company at the annual directors' meeting. He succeeds Roger L. Putnam, who was named chairman of the board.

Also elected were four new vice presidents, as follows: *ROE S. CLARK*, who continues as treasurer of the company; *E. LOVELL SMITH*, chief engineer, who becomes vice president in charge of development; *TOM MILLER*, who becomes vice president in charge of sales and *GEORGE C. FERVER* who becomes vice president and assistant to the president.

R. W. AIKEN
Becomes Plant Engineer

JAMES J. SHEA, superintendent of the Kellogg Division of the U. S. Envelope Company, Springfield, Mass. has been elected president and general manager of the Milton Bradley Company, Springfield.

At the same time, the board elected *RAYMOND W. KELLER*, now assistant to the works manager, W. O. Lippman of the East Springfield plant of Westinghouse Electric and Manufacturing Company to the positions of vice president and assistant general manager.

ROBERT N. INGERSOLL, who has been serving as head of the corporation since the resignation of Remington A. Clark in October, 1940, was elected chairman of the board of directors.

MR. FRANK E. SHURTS has just been elected as president of the American Swiss File and Tool Company. Other officers elected were *MR. R. D. MACDONALD* as vice-president and treasurer and *MR. PHILIP SCHAEFFER* as secretary. These executives have long been associated with the company, Mr. Shurts since 1919 and Mr. Macdonald since 1930.

EVEREDE BORING BAR HOLDERS

The Everede Boring Bar Holders are adjustable to fit various size lathes. (Bushings are furnished with each boring bar for use in the Holders.) Everede Holders keep the boring bar in a horizontal position, regardless of any change in the size of the lathe, within limits.

The No. 1 Boring Bar Holder is used on precision bench lathes from 7" swing to and including 9".

The No. 2 Holder is used on engine lathes from 8" swing to and including 12", and the No. 3 Holder on engine lathes from 12" swing to and including 24".

The Holders are made of case-hardened alloy steel. A tool post block is attached to the engine lathe Holders by a chain as shown.

Send for descriptive folder.

EVEREDE TOOL CO.

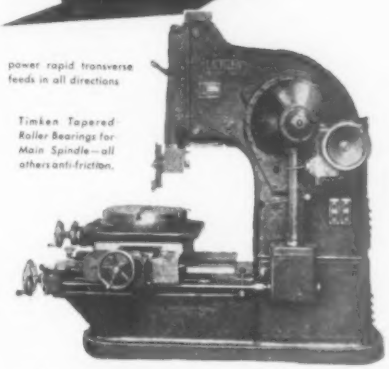
Willis Stutson
184 N. WACKER DRIVE, CHICAGO
Representatives in principal cities

Accurate, High-Speed

MOREY VERTICAL SHAPERS

8" STROKE
12" STROKE

SELF-CONTAINED MOTOR DRIVE



Built to highest accuracy standards the MOREY VERTICAL SHAPER is simple for tool-room manufacturing. Power feeds and power rapid transverse feeds in all directions are instantly available in all operating positions.

Ask for Circular 726

MOREY MACHINERY CO., INC.
410 Broome Street — New York, N. Y.

M-B "UTILITY" Pneumatic GRINDER

MODEL U-TR
A 60,000 R.P.M. Unit

STEEL HOUSING—FOR SAFETY

THESE are critical days . . . Victory hinges on production speed! That's why every plant needs several of these fast-cutting, sturdy tools as time and labor saving aids. The M-B "Utility" Pneumatic Grinder is precision-made, streamlined, excellently balanced. Grease-sealed bearings need no lubrication. Widely used and recommended . . . A highly useful companion to our famous "SUPER SPEED" Model SS-SR Pneumatic Grinder.

Also Other Models, and Air Line Filters and Automatic Air Line Lubricators.

WAR EFFORT DEMANDS THIS SPEEDY and POWERFUL TOOL

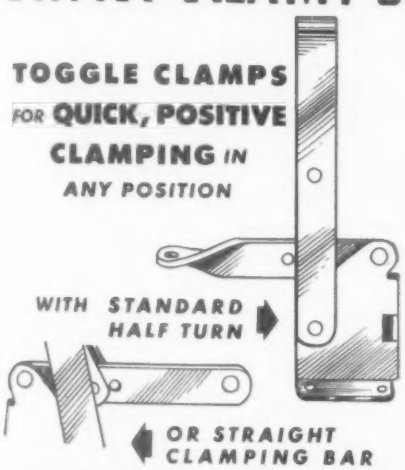
•

Write for Circular and Details of FREE TRIAL OFFER

M-B PRODUCTS • EXPORT OFFICE 44 WHITEHALL ST. New York, N.Y., U.S.A.
130 E. LARNED ST., DETROIT, MICH.

DANLY KWIK-KLAMPS

TOGGLE CLAMPS FOR QUICK, POSITIVE CLAMPING IN ANY POSITION



DANLY MACHINE SPECIALTIES, INC.
2100 South 52nd Avenue, Chicago, Illinois
MILWAUKEE • LONG ISLAND CITY, N. Y.
DAYTON • DETROIT • ROCHESTER
CLEVELAND • PHILADELPHIA
DUCOMMUN METALS & SUPPLY CO.
Los Angeles • San Francisco

DANLY DIE SETS and DIE MAKERS' SUPPLIES

T. H. L. FRONT LEVER BENCH PUNCH

Built for hard tough work — die cannot lose alignment with punch — all parts interchangeable.

Capacity ½" holes through $\frac{3}{16}$" steel; $\frac{13}{32}$" through ¼" steel. Can also be made for holes up to ⅞" in thinner metal. Stock punches and dies available from $\frac{1}{16}$" to ½" by 64ths.

Weight, 70 lbs.

PRICE WITH ONE PUNCH AND ONE DIE—

$50.00

Immediate Shipment

T. H. LEWTHWAITE MACHINE CO.
(Est. 1890)
307 E. 47 St. — NEW YORK

A DUNCAN Design

Signifies quality in workmanship and fairness in price.

•

Write or call us regarding our methods in figuring your Tool problems and cost.

•

DUNCAN
TOOL DESIGNING CO.
1015 CHESTNUT ST.
PHILA. — PENNA.

BRANCH OFFICE
1700 ELMWOOD AVE., BUFFALO, N. Y.

EDWARD T. FOWLER, who has been identified with the Foster Machine Company, Westfield, Mass., textile machinery manufacturing concern many years has resigned and *HENRY WASHBURN* of Plainville, Conn. succeeds him.

BENNETT BURGOON JR. has been appointed representative for McKenna Metals Company at Rockford, Illinois, following his resignation as mechanical engineer of the Railway Steel Spring Division of the American Locomotive Company.

GEORGE L. KLUTER, assistant to the vice-president of Warner and Swasey, was promoted to the position of works engineer. Kluter, who has been with the company for 23 years, started as a tool designer.

Officials of the Timken Roller Bearing Company recently announced the retirement of *MR. PETER VOSS*. Serving for 24 years for the company, Mr. Voss has been director of purchases since 1934.

NAVY "E" AWARD
This time to South Bend Lathe

The Navy "E" for excellence has been awarded to the South Bend Lathe Works in consideration of outstanding performance in the production of ordnance materiel for the United States Navy.

Formal presentation of the award of the "E" Pennant and Navy Ordnance Flag, was made at the South Bend Lathe factory at South Bend, Indiana, February 3, 1942.

GEORGE A. SMART
Ill, now recovered.

George A. Smart, First Chairman, Milwaukee Chapter A.S.T.E. and past National Vice President A.S.T.E. was seriously ill in a Milwaukee hospital, but is now well on the way to recovery.

J. D. McKNIGHT has been named assistant district manager of the Allegheny Ludlum Steel Corporation's Detroit office. He has been with Allegheny Ludlum for six years.

HAROLD W. MUNDAY has been appointed as district engineer for the Despatch Oven Company in the Chicago territory.

J. E. HEUSER of Ampco Metal, Inc., Milwaukee has been transferred to the company's Cincinnati office to assist Mr. J. E. Cook of that division.

APRIL MEETINGS

BINGHAMTON, N. Y.—April 1, 1942, 7:30 P.M., Link Factory Cafeteria. Speaker Mr. A. H. Moore. Subject—"Electronic Controls as Applied to Machine Tools."

DAYTON—April 13 at the Gibbons Hotel. New officers will be installed. Mr. Robert Klaas of Divine Brothers will talk on the subject "Metal Finishing."

DETROIT—April 9, featuring a motion picture and speaker from the Wright Aeronautical Corporation, showing operations in the production of aircraft engines, at Huyler's in the Fisher Building.

HARTFORD—May 4, 8:00 P.M. in Hartford Gas Company Auditorium. Speakers—J. M. Seiger, President S. M. S. Corp., Detroit, Mich. Subject—Modern Welding Practice. Make reservations with Henry A. Rockwell, Hamilton Std. Propellor Div., United Aircraft Corp., East Hartford, Conn.

HOUSTON—April 13, dinner and meeting at the Golf Crest Club. Speaker to be announced.

GREATER NEW YORK—April 6, at Hotel New Yorker, North Ballroom, 8th Avenue and 34th Street, New York. Dinner at 6:30 in the Coffee Shop. Technical Session in the North Ballroom at 8:00 P.M. Mr. H. E. Linsley of Wright Aeronautical Corp., Paterson, N. J., will speak on the subject "Manufacture of Wright Cyclone Engines."

PEORIA—April 7, with Malcolm F. Judkins, Chief Engineer, Firthite Division, Firth Sterling Steel Company speaking on the "Manufacture and Use of Cemented Carbides", at the Creve Coeur Club.

ROCHESTER — Annual Bowling Party, Friday, April 24th, at the Eagle's Hall in Rochester, N. Y.

SCHENECTADY—April 9, with W. P. Powers of the U. S. Tool Company discussing "Multislide Presses and Millers" at the Elk's Club.

SOUTH BEND—April 14, 7:00 P.M., Hotel Elkhart, Elkhart, Ind. Speaker—Rev. Paul H. Schumacker. Subject—"Present Conditions In the Far East." Make reservations with Glave Bunch.

SYRACUSE—April 14, with H. P. Bentley, Welding Engineer of the Bentley Welder Co., speaking on "Welded Construction for Jigs, Fixtures and Machines," at the Onondaga Hotel.

—HANDY ANDY SAYS—

(Continued from page 88)

Poland was attacked, without warning, they rose in defense of that state, kept their word, and the British people have taken their bombings and drubbings and kept on fighting. Oh sure, they've blundered aplenty, have made one "masterly retreat" after another, yet, have dug their toes into new terrain and started anew. That's guts! In jungle and morass, on rocky crag and burning desert, the Tommy has carried on, keeping the torch of freedom alive the while the Allied Nations cohered their resources for the overthrow of authoritarianism. Yes, Tommy, you're a great guy and I like you in spite of your traditions. Or is it because of them? Anyway, with that off my mind, let's have tiffin.

Handily Yours

ADVERTISERS APPEARING IN THIS ISSUE

The

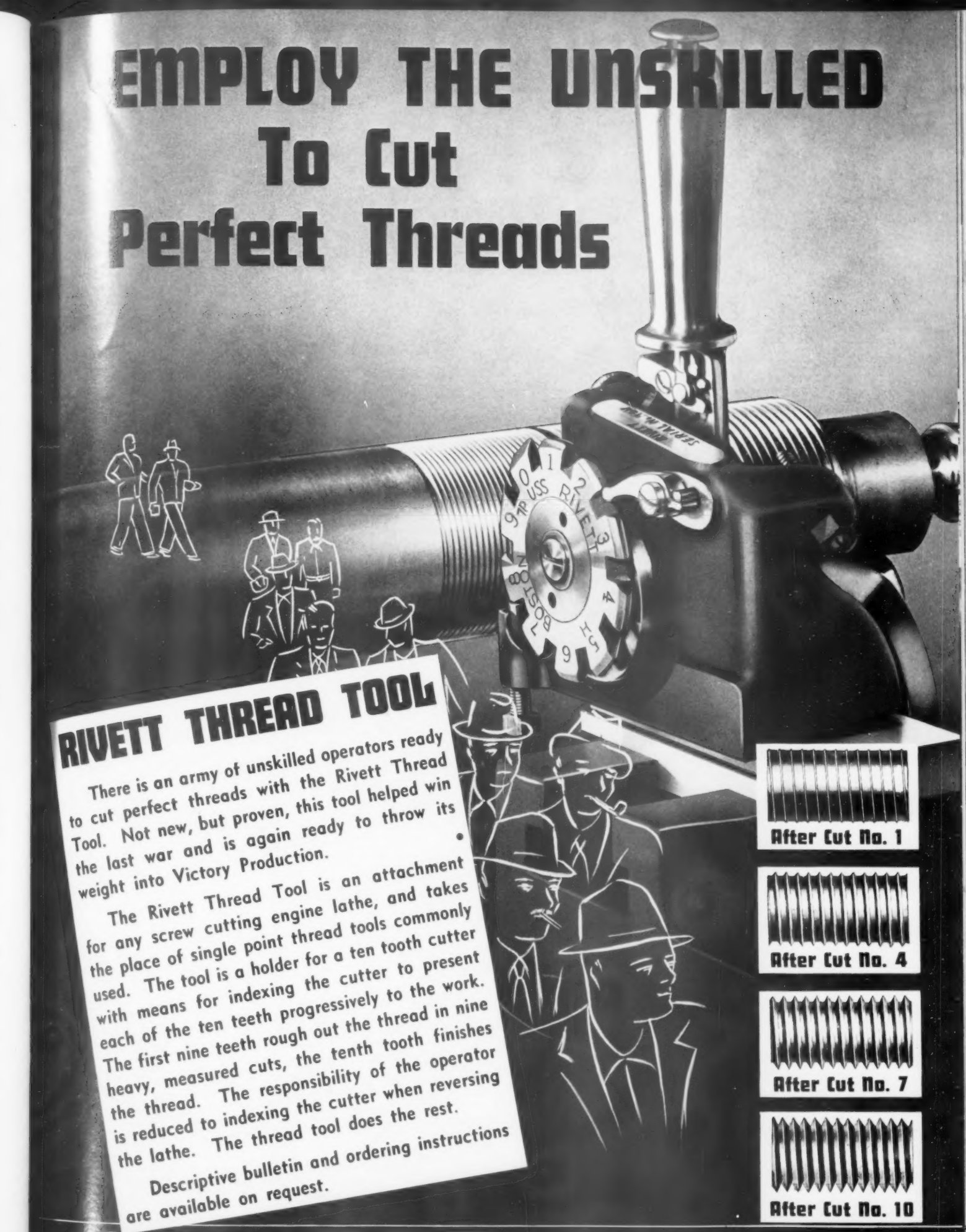
Tool Engineer

Advertising Offices: New York, Chicago, Providence, Detroit, San Francisco, Los Angeles

(see page 3 for addresses)

Please mention "The Tool Engineer" to advertisers when making inquiries.

EMPLOY THE UNSKILLED To Cut Perfect Threads



RIVETT THREAD TOOL

There is an army of unskilled operators ready to cut perfect threads with the Rivett Thread Tool. Not new, but proven, this tool helped win the last war and is again ready to throw its weight into Victory Production.

The Rivett Thread Tool is an attachment for any screw cutting engine lathe, and takes the place of single point thread tools commonly used. The tool is a holder for a ten tooth cutter with means for indexing the cutter to present each of the ten teeth progressively to the work. The first nine teeth rough out the thread in nine heavy, measured cuts, the tenth tooth finishes the thread. The responsibility of the operator is reduced to indexing the cutter when reversing the lathe. The thread tool does the rest.

Descriptive bulletin and ordering instructions are available on request.

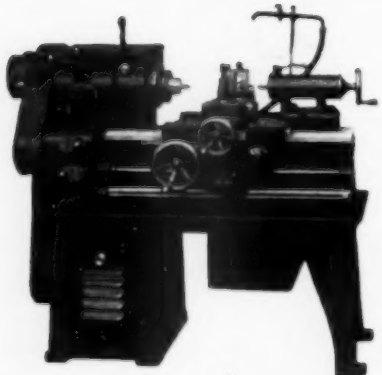
After Cut No. 1

After Cut No. 4

After Cut No. 7

After Cut No. 10

RIVETT LATHE & GRINDER INC.
BRIGHTON, BOSTON, MASS.



Wherever speed and accuracy are essential, there LeBlond Rapid Production Lathes are on the job. Built in three sizes—20" and 17" heavy duty, and 13" (3 optional headstocks) – these modern machine tools are designed for high speed production of a wide variety of small parts for guns and airplane motors.

THE R. K. LeBLOND MACHINE TOOL CO.
Cincinnati, Ohio, U. S. A.

Largest Manufacturer of a Complete Line of Lathes